

CONSUMERS' RESEARCH

INCOMPLETE FILE

Bulletin



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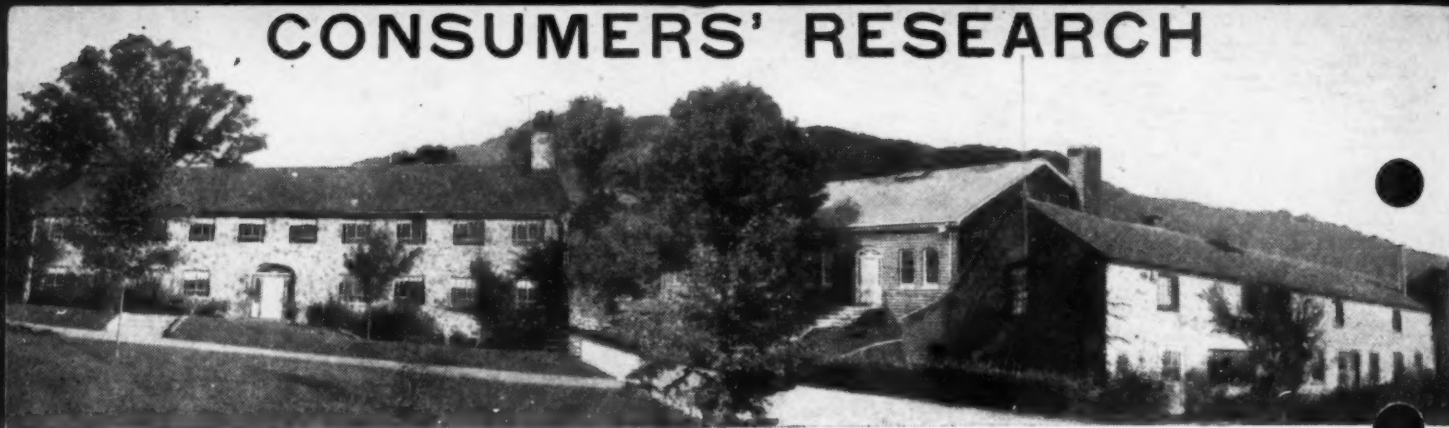
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CONSUMERS' RESEARCH



Vol. 20 • No. 5

BULLETIN

November 1947

Off the Editor's Chest

SINCE November brings Thanksgiving, one of our major holidays of the year, it seems an appropriate time to take stock of the things for which consumers in the United States have particular reason to be thankful. On the wrong side of the ledger is the fact that prices for food and clothing make far too large a dent in the family budget. Small apartments and homes for newly-married couples are practically nonexistent for renting at any price. Automobiles cost much more than in pre-war days and are not to be had, as they once were, by simply walking into a dealer's showroom and putting down a certified check for the purchase price. Reading the headlines and listening to the newscasters' wails about the rising cost of living, we get to feeling pretty sorry for ourselves. But if you think we've got troubles, what country in the world would you pick for your Shangri-la?

Take meat, currently one of the homemaker's chief causes for complaint. According to a study made by Factory Management and Maintenance, July 1947, the earnings of a typical American machine tool operator enable him to eat meat ten to twelve times a week, exclusive of factory lunches. Only two other countries equal that record. In Canada, he would have meat eight to twelve times a week; in Australia, seven to fourteen times a week. Only in Argentina, where they grow superb beef on year-round pasture, would he do better, with meat fourteen times a week. In France, Great Britain, China, India, and the Netherlands, such a worker would have meat twice a week or less.

In France, once a land of good eating, it was reported not so long ago that many workers were obliged to take time off in order to make trips to the country to secure needed food from farming areas for their families. (Reminds us of the newspaper reports during the regime of the late and unlamented OPA in this country when some city dwellers found it expedient to make trips to the home folks living on farms in Wisconsin, Minnesota, Illinois, and other parts of the Midwest, to obtain meat and butter, which were not to be had in their local stores.) A meal in a modest restaurant in Paris without meat and with one glass of very ordinary wine cost between \$3 and \$4; a really good meal, of pre-war quality, would run to around \$20. On the black market (where it was available) butter in France cost \$4.50 to \$5, according to a report made in 1945; meat was \$3.50 to \$5 a pound; coffee, \$8 to \$10 a pound, with pure coffee unavailable. Nor has the situation improved greatly in the last two years. One of the weekly news magazines reported that in August of this year ham cost \$3.30 a pound, a dozen eggs \$1.92. The days when an excellent meal could be obtained on Boul. St. Michel for 11 francs or about 44 cents are still but a pleasant dream of yesteryear.

The food in Great Britain was never one of the featured attractions for tourists even when times were better and when one took into consideration the roast beef and Yorkshire pudding at Simpson's on the Strand. At the present time the

(Continued on page 27)

Scientific and Technical Experts and Editors: F. J. Schlink, R. Joyce, M. C. Phillips, Helen P. Alleman, A. R. Greenleaf, Charles L. Bernier, and Dwight C. Aten. **Editorial Assistants:** Mary F. Roberts and B. Beam.

Symbols used to indicate sources of data and bases of ratings: A—recommended on basis of quality; AA—regarded as worthy of highest recommendation; B—intermediate with respect to quality; C—not recommended on basis of quality; CR—information from Consumers' Research's own tests or investigations; 1, 2, 3—relative prices, 1 being low, 3 high. Note that price and quality are completely differentiated in CR's listings; a quality judgment is independent of price; 46, 47—year in which test was made or information obtained or organized by the staff of Consumers' Research.

It will be advantageous if you will, whenever possible, send prompt notice of change of address at least a month before it is to take effect, accompanying your notice with statement of your old address with name in full. At least three weeks' notice must be given in any case. This rule, however, regarding long advance notice does not apply to military personnel.

CR will, of course, gladly change addresses for men and women in the services as often as required by changes in station and other circumstances.

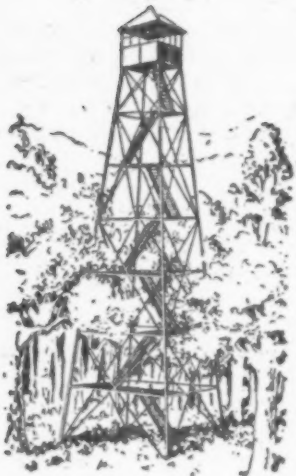
★ ★ ★ For a brief cumulative index of 1947 BULLETINS preceding this issue, see page 30.

CONSUMERS' RESEARCH BULLETIN, issued monthly by Consumers' Research, Inc. Publication Office, Box 429, Easton, Pa. Address orders and correspondence to Consumers' Research, Washington, N.J. Single copy 30c. Subscription price (12 issues) \$3 per year, U.S.A.; Canada and foreign, \$3.50. For libraries, schools, and colleges, a special subscription of nine monthly BULLETINS (October-June, inclusive) is available at \$2; Canada and foreign, \$2.50.

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The Consumers' Observation Post

DRUGS that help to bring about reduction in weight are a topic of recurring interest. Recently considerable public attention has been centered on various products based on the use of amphetamine sulphate ("benzedrine"). Studies made by Researchers Harris, Ivy, and Searle of the Northwestern University Medical School, indicate that the administration of amphetamine sulphate caused a loss of appetite, which in turn reduced the intake of food. The same result could, of course, have been accomplished if

the person anxious to lose weight resolutely followed a well-balanced diet, with diminished total food intake. Undesirable effects from the administration of amphetamine, according to the Journal of the American Medical Association, were sleeplessness and restlessness, in eight out of ten men taking part in the experiments.

* * *

OPENING BOBBY PINS is a menace to women's teeth, causing notches in the upper front teeth in many cases. Women are apparently unaware of the fact that in using their teeth to open bobby pins they are running the risk of permanently injuring tooth enamel. The danger was recently discovered by Walter Cogswell, a dentist of Colorado Springs, who with the aid of his father and brothers has invented a gadget called Bobopen which can be held between the teeth to protect them from the bobby pin. Simpler still is the substitution of the left thumbnail to do the opening job, although this does mar the nail polish a bit.

* * *

DEFINITE CONSUMER RESISTANCE to high prices of major electrical appliances, in spite of unsatisfied demand, is beginning to make an appearance. An interesting interpretation of a Federal Reserve Report by the editor of Electrical Merchandising indicated that in 1946 purchases of major appliances were made by 28% of the families surveyed, who spent 4.1 billion dollars for these products. For 1947, however, only 18 to 24% of the families plan to purchase such items, and the amount of their expenditure is put at 2.6 to 3.4 billions; this, as the editor points out, is a sizable reduction. Apparently a number of canny consumers are going to make present appliances last as long as possible. Significant is the fact that nearly half the families interviewed expected prices to fall this year.

* * *

MEAT properly prepared may be added to the formula of bottle-fed babies at the age of 6 weeks. Cooked meat in a suitable homogeneous form was included in the diet of 18 infants over a period of 6 months in a study made by Ruth M. Leverton, Ph.D., and George Clark, M.D., of the University of Nebraska. Approximately one ounce of strained meat was added to the daily formula with sufficient decrease in the amount of "dextri-maltose" called for to compensate for the calories furnished by the meat. At the end of the test period the babies given the meat supplement were found to be in better physical condition, and their hemoglobin and red cells count was higher, than that of the 15 control babies which did not have meat included in their formula. Moreover, they were more satisfied, and slept better than the control babies. The researchers concluded that this preliminary study showed that the strained meat not only checked the drop in hemoglobin levels characteristic of infants of that age, but actually promoted formation of hemoglobin and red blood cells.

* * *

BROOMS of the ordinary kitchen variety will be poorer in quality this coming year and the price will be higher, predicts The Wall Street Journal. It appears that fewer farmers are raising broomcorn because the weather has been

unfavorable and they find wheat and other crops more profitable. Unusually high prices for grain have put farmers in the higher income brackets, and some are reported as preferring not to bother with their broomcorn crop, from which the income would, as one put it, only go to the tax collector. The prospective shortage has pushed up prices of finished brooms so high that one manufacturer fears they are being priced right out of the market. Perhaps the Fuller Brush man will find customers easier to sell, when next he makes his rounds.

* * *

AN UNSUSPECTED SOURCE OF LEAD POISONING is the shooting gallery. In Baltimore, four employees were found suffering from poisoning caused by lead dust which, according to Newsweek, was present at 7 to 66 times the concentration permitted by industrial safety regulations.

* * *

MEN'S SUITS will be made in smaller numbers this next spring. In fact, The New York Times predicts that the drop in production will be from 20 to 25%. Apparently men will just not pay the prices being asked, and with the prospect that \$32.50 to \$35 suits will be priced at \$50 to \$55 due to increases in the prices for rayon linings and woolen and worsted fabrics, and that strong sales resistance may follow, the manufacturers want to avoid being stuck with unsalable garments. The government, it should be noted, is currently guaranteeing wool growers a price of 42.3c a pound for wool, although last April it had a huge stock pile of 400 million pounds already purchased from domestic stocks. The money for such purchases comes as usual from the taxpayer whose funds are used, first, to pay the wool grower a price higher than the market would bring. Then the taxpayer is forced to dig into his wallet to pay a higher price for the finished product in the form of a suit. When the price of suits becomes too high, the consumer cuts down his buying; the manufacturer stops turning out so many suits; less wool is woven into cloth; and the government stock pile becomes larger. Government "planning" brings about some strange results; the only thing that seems certain is that where government policies affecting prices to consumers are concerned, officialdom does not really want prices to be low.

* * *

NEW OR NEWLY AVAILABLE: Fireplace Logs made from waste products are again being extensively advertised. Tests by CR of two brands, Pres-to-logs and Kindle-Lite Logs, show that these products, particularly the latter, have relatively high heats of combustion. Pres-to-logs had a heat value of 8275 Btu.'s (British Thermal heat units) per pound and Kindle-Lite nearly twice as much or 15,060 Btu.'s per pound. Calculations based on the measured heat content show that Pres-to-logs provided 4560 Btu.'s per cent of cost, and Kindle-Lite 950 Btu.'s per cent. Even at the present high price of firewood in two regions 40 to 70 miles from New York (around \$20 per cord), Kindle-Lite would, if its rate of burning were the same as the wood fuel, give only about 1/7 as much heat and Pres-to-logs about 2/3 as much heat for a given expenditure as is given by ordinary fireplace logs of poplar, chestnut, or elm. The rapid burning of the synthetic logs with their paraffin wax content will tend to increase greatly the heat loss up the chimney, in contrast to which the long-time glowing embers of a natural wood fire tend to deliver more of the heat to the room. For these reasons it seems there would rarely be occasion to purchase synthetic logs instead of natural ones, unless some unusual element of convenience were involved that made relative cost a matter of no importance.

Fiat Caulking Compound (Fiat Metal Mfg. Co., Long Island City, N. Y.; 40c for 4-oz. tube) is a white oily paste intended for use with shower cabinets and doors of the same manufacturer, to insure a leakproof installation. It was found on analysis to consist of 60% talc, 10% turpentine, 13% mineral oil, and 17% drying oil.

So-Lo's Pipe Joint Compound, in a small glass jar containing about 1 fl. oz., is one of the popular compounds sold in 10-cent and other household supply stores, for making up joints of water pipes. This product is meant for water, gas, and steam piping as a lubricant to facilitate making up the joint

(The continuation of this section is on page 37)

Two More Small or "Personal" Washing Machines

*One of Them Is News—
It Washes Very Well*

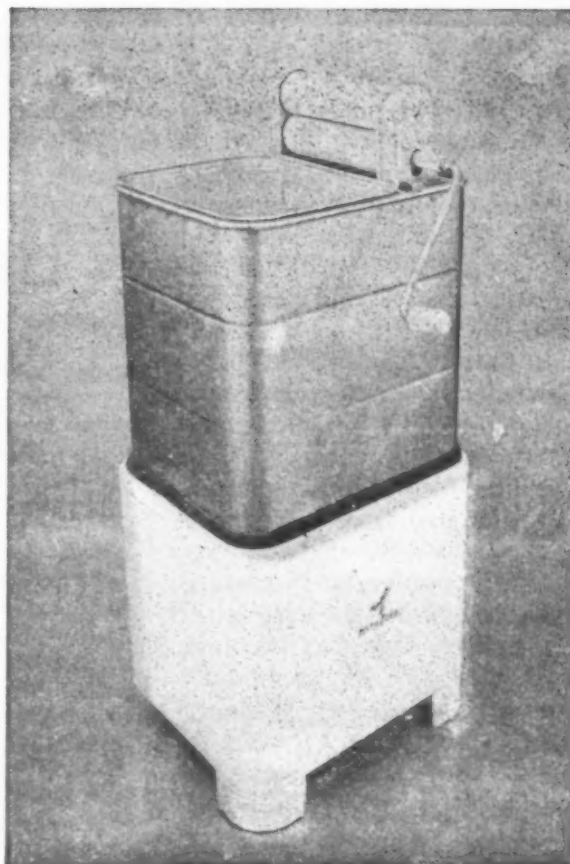
TESTS have just been completed on the *Cinderella* and *Monitor* personal-sized washing machines, both of which have been widely advertised as having exceptionally good washing effectiveness.

The *Cinderella* is of a type which is rather common among small washers, having the motor mounted on the lid; the tub is about 12½ inches in diameter and 11 inches deep. A cylinder, hung from the lid, fitted inside the tub with about ¼-inch clearance all around. During operation, a plastic fan blade attached to the motor shaft draws air up through the clothes and returns it through the opening between tub and cylinder, imparting a surging action to the water. Required great care in loading clothes into washer to prevent entrapment of air, for when air is entrapped, the clothes "balloon" and washing action ceases; then machine must be shut off to squeeze out the air and readjust the load. This is considered a serious disadvantage as much more attention on the part of the operator is required than with other types of machines. The noise of the sample tested was very loud (and pulsating) compared with other washers, also much greater than that of the pre-war model of the same design, and we believe almost any user would find it objectionable on that account.

The *Monitor* is of a different

type from any of the other small washers examined. It is square instead of round and is equipped with a manually-operated wringer. Storage space needed is 15 in. x 15 in. x 30 in. high with the wringer folded inside the tub. The tub size is 11¼ in. x 14 in. x 15¼ in. (deep). The manually-operated wringer pivots so that it can be stored inside the tub when the machine is not in use. The washer is mounted on wheels, which makes it easily maneuverable. A simple round impeller, set flush in the side of the tub, actively agitates the load with a (continuous) rotary motion centered at the impeller, an innovation in design for washing machines.

The two portable washers were tested just as the standard-sized



Monitor Aerator, Model AERW-4



Cinderella, Model D

machines previously reported on, for electrical leakage, proof-voltage breakdown, washing effectiveness, temperature rise of the motor under operating conditions, dewatering effectiveness (*Monitor* only), energy input, clothing wear, and endurance. They were also given a critical engineering examination.

Both were found satisfactory as to electrical safety and neither produced any appreciable wear of the material being washed, during 100 hours of operation. The effectiveness of the *Cinderella* in washing was about average for small washers and was on a par with the poorer standard-sized washers. The dirt-removing performance of the *Monitor*, on the other hand, was the best of any washer, large or small, tested by Consumers' Research; its efficiency in cleansing was even better than that of a good commercial laundry which hitherto had been found to excel all home washing machines studied. Perhaps the impeller-aerator de-

velopment could be used in other cleansing units.

Detailed results of the tests on the two machines will be found in the listings. Ratings are cr47.

B. Intermediate

Monitor Aerator, Model AERW-4 (Monitor Equipment Corp., New York 63) \$64.50. Over-all dimensions 15 in. x 15 in. x 30 in. with wringer folded inside the tub. Square stainless steel tub on enameled base. Maximum capacity: 8 gal. water, 4 lb. clothes, or 1 lb. of clothes to 2 gal. of water, if it is desired to wash a smaller quantity. (The instruction card which accompanied washer gave maximum load as 3 lb. of dry clothes.) Equipped with manually-operated wringer which turns down inside the washer out of the way when not in use. Rollers make it easy to move from place to place. Washing effectiveness best of any of the post-war washers so far tested by CR, either standard-sized or "personal" type. Effectiveness of the wringer in removing water, fairly good. Opening in case would permit access of exploring fingers of a child to moving parts, a needless point of hazard. During operation, temperatures of the motors of both samples tested ran far above ac-

cepted limits; in the first sample the motor failed to operate after 41½ hours of the endurance test. (The replacement unit operated for the full 100 hours.) At the end of the 100-hour run, the washer showed no visible wear or deterioration of parts. Power input, 280 watts. With a better motor and properly safeguarded opening for cord, appliance would have warranted an A rating. 3

C. Not Recommended

Cinderella, Model D (Cinderella Mfg. Co., Jackson, Mich.) \$34.95. White porcelain enameled tub, 12¾ in. in diameter and 10¾ in. deep with black painted cover in which motor is mounted; a galvanized cylinder, hung from the cover, fitted down inside the tub. Capacity: 3.5 gal. of water, 2 lb. of clothes. Washing effectiveness about average for small washers, and on a par with the less satisfactory standard-sized washers. Power input, 266 watts. Temperature rise of motor during operation well within accepted limits. Performance in 100-hour endurance test, satisfactory. The cylinder which fitted inside the tub was badly coated with soap residues at end of tests due presumably to the zinc coating, which would indicate that there might be considerable difficulty in keeping the machine clean. Very noisy in operation. 2

The Strength of the Enterprise System Lies in the Diffusion of Authority, and of the Power to Make Decisions

OUR ECONOMY has the tremendous advantage of possessing three and a half million business enterprises outside of agriculture and about six million business enterprises in agriculture. This means that the American economy has nearly ten million places where innovations may be authorized. Have you ever thought of that? Ten million places where ex-

periments may be tried, where no further authority is needed to authorize an experiment. Our economy operates under about ten million separate private business budgets. No regimented economy can hope to compete in dynamic drive with an economy which possesses nearly ten million independent centers of initiative. I don't see that the British or the

Russians have a chance. They will fall farther and farther behind unless in some way or other, they can multiply the centers of initiative, increase the numbers of the authorities who can authorize innovations.

—From an article by Sumner H. Slichter, Lamont University Professor at Harvard University, appearing in *United States Investor*, published in Boston.

Some Simple Cameras in the Price Range \$3 to \$20

IN VIEW of the scarcity of really good cameras and the extremely high prices of cameras of every grade, some amateur photographers in need of equipment may prefer to purchase box cameras or other equivalent fixed-focus cameras, and reconcile themselves to using such instruments until quality is higher and prices are lower on cameras in the high-price brackets. These simple cameras, which in pre-war days sold at prices between about \$1 and \$10, now sell at from about \$3 to as much as \$20, or even more. Nevertheless, even at these inflated prices, and even if the cheaper camera is discarded after two or three years' use, they afford a means of avoiding the loss which would be incurred by purchasing a higher grade new or used camera at an out-of-line price.

For example, instead of a *Rolleiflex* at \$300, an amateur might consider an *AnSCO Clipper* at \$9.95, and discard it to purchase a *Rolleiflex* when the price of the latter has returned to somewhere near pre-war level,



AnSCO Clipper

WITH the shortage of good cameras following the war, there has been a perfect "rash" of small cameras which, to the inexperienced amateur, may often seem to be equivalent to or a fair substitute for the high-priced small cameras of the *Rolleiflex* and *Super Ikonta B* or *C*, or the *Vest Pocket Tenax* types widely sold in pre-war years. At first these cameras, which were largely imitations of their betters, were not taken seriously, but the number of them now being offered strongly suggests that a great many people are deceived by their attractive appearance and oftentimes deceptive advertising, and are buying them. It appeared in order, therefore, to make an investigation of the characteristics of various popular small cameras, so that the consumer might be helped to avoid buying a make which is likely to fall below his expectations, and could buy, if he cared to, those which were fairly good, or at least better than average.

or at least to a figure not far above \$175.

Fixed-focus cameras admittedly are limited in their capabilities and are not suitable for any photography in which sharp rendition of detail is required. For snapshots of scenes, vacation activities, and the like, when only slight enlargement or none is desired, they do a reasonably acceptable job. Even a photographer who cherishes the hope of having pictures accepted in one of the

salons may achieve success from use of a fixed-focus camera if he is one who cultivates the soft-focus vogue.

Originally nearly all fixed-focus cameras were fitted with single (meniscus) lenses, but some years ago a few manufacturers started using double lenses on some models. This represents a distinct advance, since a double lens is inherently superior to a single lens of equally good design.

The speed of most lenses used on fixed-focus cameras is slow, between about *f*:11 and *f*:22, although a few are faster. The relatively small apertures are dictated both by the low degree of correction possible in these lenses and by the practical necessity for maintaining such depth of field that objects at distances other than that for which the lens is focused will appear to be sharply defined. Ordinarily a fixed-focus camera is focused at what is known as the hyperfocal distance (which is a distance such that objects situated at one-half that distance and objects situated at infinity appear equally sharp.)



AnSCO Panda

Comparative Cost of Various Sizes of Negatives, Made on Roll Film

Picture Size	Negative Material	Cost per Negative, cents	Cost per Square Inch, cents
24 x 36 mm. (0.95 x 1.42 in.)	20-exposure roll	4.1	3.0
24 x 36 mm. (0.95 x 1.42 in.)	36-exposure roll	3.0	2.2
28 x 40 mm. (1.10 x 1.58 in.)	No. 828 Bantam roll	4.0	2.3
1 $\frac{1}{4}$ x 1 $\frac{5}{8}$ in.	16 exposures on No. 127 roll	2.0	1.0
1 $\frac{5}{8}$ x 1 $\frac{5}{8}$ in.	12 exposures on No. 127 roll	2.7	1.0
1 $\frac{5}{8}$ x 2 $\frac{1}{2}$ in.	8 exposures on No. 127 roll	4.0	1.0
1 $\frac{5}{8}$ x 2 $\frac{1}{4}$ in.	16 exposures on No. 120 or No. 620 roll	2.4	0.7
2 $\frac{1}{4}$ x 2 $\frac{1}{4}$ in.	12 exposures on No. 120 or No. 620 roll	3.2	0.7
2 $\frac{1}{4}$ x 3 $\frac{1}{4}$ in.	8 exposures on No. 120 or No. 620 roll	4.8	0.7
2 x 2-7/16 in.	16 exposures on No. 616 roll	2.7	0.6

Working with a camera of this type over a period of two or three years may have two salutary effects upon a thoughtful amateur: use of a slow lens should demonstrate how unnecessary for a great majority of photographic work is the extremely high-priced, superspeed lens for which he may have yearned; the large percentage of satisfactorily exposed negatives which he will obtain with a single shutter speed and one or two diaphragm openings will show the fallacy of the belief that an exposure meter and a lot of other complexities are essentials for the serious photographer.

CR does not recommend one of these cameras with lenses of small aperture for use with color film. With color film, adequate exposures can be obtained only in full sunlight on the brightest days; besides, the deficient color correction of the lenses may also result in un-

pleasant fuzziness in a color picture.

This study included only cameras which make pictures to and including 2 $\frac{1}{4}$ x 3 $\frac{1}{4}$ inches in size. The sizes included in this range, and the cost per exposure, based on the use of Eastman *Plus-X* film, are shown in the above tabulation.

From this table it can readily be seen that the Bantam and 35 mm. sizes are relatively uneconomical, and by a considerable margin the most expensive per square inch of picture; Bantam-size pictures, for example, cost exactly twice as much as do the slightly larger pictures obtained by making 16 exposures on a No. 127 roll, and cost 25% more than the popular 2 $\frac{1}{4}$ x 2 $\frac{1}{4}$ -inch pictures made by taking 12 exposures on a No. 120 roll, or 50% more than the substantially equivalent 2 x 2-7/16-inch pictures made by taking 16 exposures

on a No. 616 roll. From an economy standpoint, therefore, *it is uneconomical to buy a camera which requires Bantam film, and almost equally uneconomical to purchase one which uses 35 mm. perforated film*, unless (in the latter case) the user wishes to buy film in bulk and prepare his own rolls.

In general, a picture smaller than the 1 $\frac{5}{8}$ x 2 $\frac{1}{2}$ -inch size made by taking 8 exposures on a No. 127 roll, or the 1 $\frac{5}{8}$ x 2 $\frac{1}{4}$ -inch size made by taking 16 exposures on a No. 120 roll will require enlargement, to be practical for viewing. A camera which takes a smaller picture should be purchased *only* if small bulk is considered definitely more important than efficiency and economy. The limitations of a simple lens are so considerable that CR believes that none of those cameras which take the smallest picture sizes should be rated

higher than *B. Intermediate*; those with single meniscus lenses are rated *C. Not Recommended*.

Many cameras fitted with single lenses are being made with a curved focal surface in an attempt to compensate for curvature of the field of the lens; this represents some improvement, but obviously cannot correct the condition fully, since the lens field has (approximately) a spherical curvature, while that of the focal surface is necessarily cylindrical in type.

Addition of at least one tripod socket would constitute a decided improvement, and could be made at insignificant cost; a few of the low-priced cameras are so equipped.

Many cameras are available with shutter-contacts and sockets for use with flash guns supplied as extra equipment. These simple flash units are actually more dependable than the expensive separate synchronizers, because of the simplicity of their construction. Whether the additional cost of camera and flash unit, and the cost of flash bulbs, are justified on cameras of such moderate capabilities is a matter for the prospective buyer to decide for himself. The only practical use which occurs to us is for making pictures of babies or young children who won't keep still, by parents who do not wish to spend the money for a camera which has a faster lens. Otherwise the popularity of simple, low-priced flash cameras appears to be based on nothing more substantial than style and novelty appeal.

A number of "imitation reflex" cameras have appeared. In these cameras, which are fitted with fixed-focus lenses, the screen on which the image is

shown is merely an oversized finder; as such it is useful in that it gives an image which is easier to see than that shown by the tiny finders with which fixed-focus cameras were traditionally equipped. Addition of the hood increases the bulk of the camera unnecessarily; the large brilliant finder such as is used on the *Panda* is a better compromise.

Several cameras were tested thoroughly and others were inspected critically for the purpose of rating. Ratings are to be understood as relative to cameras of this grade; obviously a camera equipped only with a single or double lens of simple construction *cannot* make pictures which show the fine detail obtainable with a camera equipped with a fine anastigmat lens, yet each may deserve a rating of *A. Recommended* in its class.

In the listings which follow, cameras which were tested thoroughly are designated by an asterisk (*). Cameras designated "rigid" are essentially box cameras in that they do not provide for focusing adjustments, but are made in more elaborate designs than those designated "box" cameras. Listings are alphabetical within groupings.

A. Recommended

DOUBLE-LENS CAMERAS

**Clipper* (AnSCO Div. of General Aniline & Film Corp., Binghamton, N. Y.) \$9.95. Semi-folding type; front is held on a rectangular metal tube which pulls out about 1¼ in. and locks firmly into operating position. One snapshot speed, and bulb. One diaphragm stop. Lens of about 3-in. focal length. Plane focal surface, and pressure plate. Rugged construction. Exceptionally easy to load. Lens quality good for its type. Considered second only to *Jiffy Kodak* of all cameras in the group.

16 pictures 2 x 2-7/16 in. on No. 616 roll.

**Jiffy Kodak Six-20* (Eastman Kodak Co., Rochester, N. Y.) \$12.12. Folding type. One snapshot speed, and time. Three diaphragm stops believed to be about f:11, f:16, and f:22. Lens had two focusing positions: one for distances of from 5 to 10 ft.; the other for distances greater than 10 ft.—an excellent feature. Lens of about 4¼-in. focal length. Plane focal surface and pressure plate. Lens quality equal to that of *Clipper*. Considered the best camera of group tested. 8 pictures 2¼ x 3¼ in. on No. 620 roll.

SINGLE-LENS CAMERAS

**Panda* (AnSCO) \$4.89. Rigid type. One snapshot speed only. One diaphragm stop. Curved focal surface, no pressure plate. Had a brilliant finder about 1 in. square which would be practically as good for a fixed-focus camera as the hooded finder of the "imitation reflex" type of camera. Easily loaded and smooth in operation; well-made, of plastic. Convenient shape and good appearance. Results equal to those obtained with any other camera with single lens; considered the best value in the group, price considered. 12 pictures 2¼ x 2¼ in. on No. 620 roll.

Pioneer (AnSCO) \$7.48. Rigid type. One snapshot speed. One diaphragm stop. Curved focal surface, no pressure plate. Flash unit available. Easy to load and use; fairly well made. 8 pictures 2¼ x 3¼ in. on No. 620 roll.

B. Intermediate

DOUBLE-LENS CAMERAS

**Beacon* (Whitehouse Products, Inc., 360 Furman Ave., Brooklyn, N.Y.) \$9.95. Semi-folding type of plastic construction; rigid front section pulled out to operating position. Compact when closed. One snapshot speed. Lens of 46 mm. focal length, with one diaphragm stop. Plane focal surface with pressure strips, at edges of film only. One tripod socket—good feature. Performance notably good for a camera of this grade; would be rated *A. Recommended* except for small size of picture. 16 pictures 1¼ x 1¼ in. on No. 127 roll.

Winpro 35 (Webster Industries, Inc.;

Rochester, N. Y.) \$10.95. Rigid type. Lens of 40 mm. focal length. Fairly well made. Used 35 mm. perforated film in standard cartridges.

SINGLE-LENS CAMERAS

**Baby Brownie Special* (Eastman Kodak Co.) \$3.16. Rigid type. One snapshot speed only. Curved focal surface, no pressure plate. Shutter release less convenient than on some other cameras. Lens performance average for its type. The sample tested had defective film winding mechanism, so that only 6 frames could be turned into position for exposing; otherwise would be rated A. *Recommended.* 8 pictures $1\frac{1}{8} \times 2\frac{1}{2}$ in. on No. 127 roll.

**Fed-Flash* (Federal Manufacturing & Engineering Corp., Brooklyn 5, N. Y.) \$9.95; flash unit \$3.95 additional. Rigid type. One snapshot speed only. 64 mm. lens with one diaphragm stop stated to be f:15. Curved focal surface, no pressure plate. Sharpness of pictures not equal to those made with *Panda* or *Baby Brownie*. Judged overpriced. 8 pictures $1\frac{1}{8} \times 2\frac{1}{2}$ in. on No. 127 roll.

**Spartus Full-Vue* (Spartus Camera Corp., 711 W. Lake St., Chicago 6; distributed by Spencer Co., 715 W. Lake St., Chicago) \$9.95. Imitation reflex type. One snapshot speed, and bulb. Viewing screen about 1-11/16 in. square, and not full size as advertising implies. Lens performance average for type. Heavy construction; film winding mechanism very tight. Bulk, weight, and less convenience in use, as well as high price, make this camera a poor buy in comparison with *Panda* or *Baby Brownie*. 12 pictures $2\frac{1}{4} \times 2\frac{3}{4}$ in. on No. 120 roll.

The following cameras are considered to be in this *B-Intermediate* class, although they were not individually tested.

Taking 8 pictures $2\frac{1}{4} \times 3\frac{1}{4}$ in. on No. 120 or No. 620 roll:

Kodak Vigilant Six-20 Junior. \$20.20.

Folding type.

Six-20 Target Brownie. \$5.75. Box type.

Six-20 Flash Brownie. \$10.35; flash unit \$2.92 additional. Box type.

Taking 12 pictures $2\frac{1}{4} \times 2\frac{1}{4}$ in. on No. 120 or No. 620 roll:

Camflex. \$9.95. "Imitation reflex" type.

C. Not Recommended

DOUBLE-LENS CAMERAS

Camro (Argus, Inc., Ann Arbor, Mich.) \$9.95. Rigid type. Three diaphragm stops, the largest claimed to be f:9.7 and to be suitable for color photography; f-numbers of other two stops not stated. One snapshot speed, and time. Molded case of attractive appearance. In the sample examined, diaphragm stops were not concentric with lens axis—a serious defect indicating gross carelessness in assembly and inspection. 8 pictures approximately $1 \times 1\frac{1}{2}$ in. on No. 828 Bantam roll.

SINGLE-LENS CAMERAS

Meteor (Universal Camera Corp., 28 W. 23 St., New York 10) \$15; flash unit \$7.30 additional. Rigid type. Four diaphragm stops: f:11, f:16, f:22, f:32. Focusing mount for 5 ft. to infinity. Provision for flash unit. Built-in exposure meter. Lens has anti-reflection coating; with only one lens surface inside the camera to produce flare, the value of the coat-

ing (except as a sales point) is open to doubt, to say the least. Flimsy construction. Design appears to have been directed toward a gaudy appearance and inclusion of gadgets which serve as advertising bait but which are of doubtful value, particularly in a camera of this grade. CR considers the price high, even if quality of construction were satisfactory. 12 pictures $2\frac{1}{4} \times 2\frac{1}{4}$ in. on No. 620 roll.

Spartus (Spartus Camera Corp.) \$14.95; flash unit \$4.50 additional. Rigid type. Three diaphragm stops: f:7.7, f:11, f:16; focusing mount. Use of a single lens at f:7.7 not recommended. Molded plastic construction. Tripod socket—good feature. One snapshot speed, and bulb. Lens of 50 mm. focal length. Used 35 mm. perforated film in standard cartridges.

The following cameras are considered to be in this *C-Not-Recommended* class although not individually tested.

Taking 12 pictures $1\frac{1}{8} \times 1\frac{1}{8}$ in. on No. 127 roll:

Brownie Reflex. \$12.66, including flash unit. "Imitation reflex" type.

Foto-Flex. \$7.96. "Imitation reflex" type.

Taking 16 pictures $1\frac{1}{4} \times 1\frac{1}{8}$ in. on No. 127 roll:

Clix-O-Flex. \$5.95. "Imitation reflex" type.

Falcon Flex. \$6.50 and \$8.50. "Imitation reflex" type.

Falcon. \$3.98 to \$7.50. Various models, some with flash. Rigid type.

Rocket. \$5.50. Rigid type.

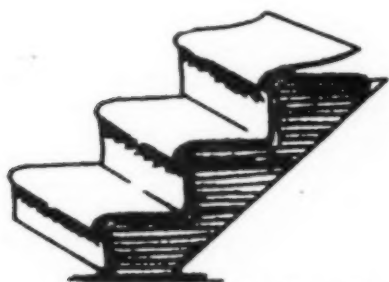
Trusite. \$5.95. Rigid type.

All other single-lens cameras which use 35 mm. film, or take 12 or 16 pictures on No. 127 roll are also considered in this not recommended class.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946, of Consumers' Research Bulletin published monthly at Easton, Pa., and Washington, N. J., for September 1946-September 1947—State of New Jersey, County of Warren ss. Before me, a notary public in and for the State and county aforesaid, personally appeared F. J. Schlink, who, having been duly sworn according to law, deposes and says that he is the editor of the Consumers' Research Bulletin and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily, weekly, semiweekly or triweekly newspaper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the act of August 24, 1912, as amended by the acts of March 3, 1933, and July 2, 1946 (section 537, Postal Laws and Regulations), printed on the reverse of this form, to wit: 1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Consumers' Research, Inc., Washington, N.J.; Editor, F. J. Schlink, Washington, N. J. 2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Consumers' Research, Inc., a non-profit corporation, not a business enterprise, not operated for profit; Washington, New Jersey. Stock, none. 3. That the known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None. 4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. F. J. Schlink. Sworn to and subscribed before me this 15th day of September, 1947, Marie M. Beers. (My commission expires May 14, 1951.)

Selection and Care of Rugs and Carpets

SINCE the floor covering is one of the most important items in a room, both as to original cost and in terms of the decorative effect, its selection deserves thought and care. While wall-to-wall carpets show a trend of increasing popularity, they lack the adaptability of rugs, which can be used in nearly any room whatever its size, a factor that is an important consideration for people who rent and are likely to move from time to time. Plain-color carpeting makes a room look larger, while a large pattern makes it look smaller. In



Courtesy Fred Eldean Organization, Inc., 670 Fifth Ave., New York 19.

Wear is exceptionally rapid at the edge of the stair tread, and stair carpets should be installed with underlays or rug cushioning of some type at these points. Sponge rubber underlays have been found particularly suitable for this purpose because they keep their thickness and resilience.

moderate-sized rooms, therefore, a plain color or small pattern will give a less-crowded effect.

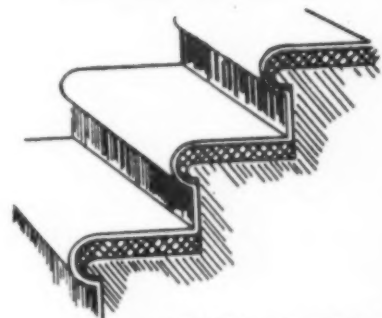
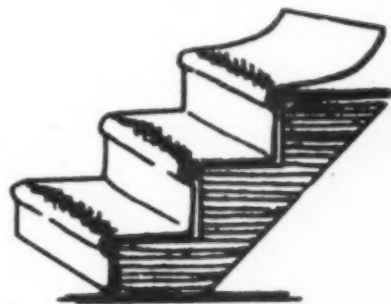
The color of the rug should be selected to harmonize with the other furnishings of the room. Solid-color rugs are usually rather neutral in tone.

Where a rug or carpet will receive very hard wear, as in a living room or on a stairway, durability should be an outstanding qualification. With stair carpet it may be advisable to turn an extra length under, either at the top or bottom, and after a certain amount of wear on the tread, to move the whole length so that portions previously covering the risers are shifted to take the wear on the treads.

The real problem in buying a rug is to judge serviceability in terms of cost. Rug labeling which would provide information on quality is almost nonexistent. If enough consumers were to show an active interest in such labeling, it would in time appear on every rug and carpet. Part of the difficulty in securing adequate information is the lack of uniform standards for rating quality. Methods for classifying materials and construction could be worked out, however, and grades established indicating first quality, second quality, etc.

Several inspections are made of the rugs before they leave the factory; often defects are corrected by hand. Rugs which do not come up to standard are sold as seconds at a reduced price. These may or may not be a good buy according to whether the imperfection affects the wearing quality or not.

One method of securing standards of quality would be



Courtesy Fred Eldean Organization, Inc., 670 Fifth Ave., New York 19.

For best results, stair carpet should be cut a foot longer than necessary, with the extra length folded under in one or two risers at the top. The carpet can then be shifted an inch or two downward when it begins to show wear over the nose of the tread. In this way, the carpet can be shifted several times before it will be necessary to replace it, with the most worn sections being comparatively hidden on the risers. The excess at the foot of the stairs can be folded under the riser at the bottom step after each shift.

to base the grades on specific wear tests, made with a machine designed for this purpose such as that developed by the National Bureau of Standards¹. This produces wear in a few hours corresponding to several years of practical use.

When buying a rug, be sure to make your purchase from a reputable dealer. Cases have been reported where rug ped-

¹H. F. Shiefer, J. Research, Natl. Bur. Standards, 29,333-79 (1942).

dlers claimed their goods were made by the blind², or that the rugs were imported under cover through someone in the Navy, or obtained by some other questionable method. Such rugs are often represented as priced far below their real value, whereas, in fact, they are likely to be of poor quality and overpriced.

Another method sometimes used to sell rugs is "bait advertising." This means advertising in a way that appears to offer an extremely good buy, but when the person goes to the store to buy the rug, he is told the supply is already exhausted, or that that particular color is no longer available. Once in the store, the would-be purchaser is high-pressured to buy something else, usually something similar but at a price well above that advertised. The best insurance against being taken in by such sharp practices is to buy only from a reputable dealer who is known to stand behind his merchandise.

Materials Used in Rugs and Carpets

The backing of a rug consists of warp and weft threads. Warp threads run lengthwise of the rug; weft threads—also called filling—run crosswise. In this coarse backing of warp and weft threads are woven, by a number of different construction methods, the pile threads or tufts which form the face or upper surface of the rug. These pile threads may be cut, so that they are ends of threads sticking up more or less at right angles to the backing into which they are woven, or they may be looped and left uncut.

Cut pile is much the more common.

The Pile

The most durable fiber for the pile threads is wool. It not only wears better, but it soils less easily than cotton and than most types of rayon. This wool is coarser, more wiry, and more resilient than that used in clothing. Such wools are imported from various countries, including India, Iran, the British Isles, South America, and China. Different types of wool are blended to provide for stiffness, fullness, luster, etc. If the pile is all wool it will, as a rule, wear longer, will keep its original appearance better, will not soil as readily, and will not mat down as cotton pile does.

During the war imported carpet wools were hard to obtain because of the shortage of shipping. There was also a shortage of labor and many manufacturers converted part of their equipment to war work, the weaving of blankets, military overcoats, etc., using their limited supplies and facilities for making the same grades of rugs as previously, in much smaller quantities.

Another method for making scarce materials go as far as possible was to use a blend of wool and cotton, wool and rayon, or all three fibers. When rayon was first tried in the pile of rugs, the ordinary clothing type was used. It was soon realized that this was not suitable, and research was undertaken by the rayon producers to develop a quite different physical form of fiber especially suited to this purpose. The result was the production of rayon staple of varying thicknesses approximating the different thicknesses of natural wool. This is sometimes mixed

50:50 with wool; it is also used alone for making all-rayon rugs. Cotton, although used to supplement other fibers during the war, is not a satisfactory pile fiber because of its softness. It may be used in making the less expensive flat-weave rugs which have no pile surface, but merely a flat woven structure.

In buying a pile rug, always ask what the pile fabric is. If it is part rayon you should expect to pay less than if it is 100 percent wool. The new rayon-wool mixtures should wear well, but even the special rayon fiber for rugs cannot be considered to have quite the same lasting quality as wool; certainly it is less expensive to produce. An advantage of rayon is the ability to control its production exactly as to thickness or "denier," and as to luster or lack of it. This offers the possibility of introducing new and variable effects. Not all of the rayon used in rugs is of the special springy type, which is found in the better quality rugs. When rayon is present in the rug, the purchaser should ask whether it is the carpet-type.

The Backing

The material for the backing must be very strong, since the warp and weft threads hold the rug together and take much of the wear. Linen has been used for this purpose, but more commonly jute, a strong vegetable fiber imported from India. Cotton has frequently been combined with jute or even used alone, although such thread has to be heavily sized to increase its tensile strength. In fact, nearly all backing threads carry sizing to give them greater bulk, strength, and stiffness so that the rug will stay flat on the floor and will not crumple easily.

²Boston Better Business Bureau, 1941.

To replace jute, a special paper fiber made from wood pulp has been developed for rug backing. This is chemically treated and tightly twisted to give an extremely tough, water-resistant fiber, which appears to have the wearing properties necessary for a satisfactory replacement for jute.

Flat-Weave Rugs

The less expensive rugs having no pile or tufts, but woven in a different manner to give a flat surface are called flat-weave rugs. Many of them are reversible, with threads woven in such a way that the two sides have essentially the same wearing properties. Such rugs are particularly popular for sunrooms, playrooms, and summer use. Made of cotton, fiber, sisal, and similar materials, they lack the richness of appearance of pile rugs, and as a rule they lack serviceability as well.

How to Examine a Rug

No one factor can be used for evaluating the quality of a rug. In examining a pile rug, fold it back on itself to see how long the pile is and how thick it is. In general, long, closely packed tufts represent high quality and durability. In other words, the more material that is present per square inch, the better the quality, as a rule. Another factor, besides depth and density of pile, is the twist

of the pile thread. A tightly twisted thread is usually stronger than a loosely twisted one. While a long pile is desirable, if it is sparse and thin, it may not wear as well as a short, dense pile.

Worsted is made from long-staple wool, while woolen is made from shorter strands. Worsted is spun with a tight twist, while woolen fiber has a much looser twist. These differences account for the superior wearing qualities of worsted over those of plain wool.

A good procedure in making a selection is to ask the salesman to show you side by side two rugs of the same weave which sell at different price levels. See whether you can spread the pile easily with your fingers to expose the foundation fibers. See how springy and resilient the pile threads are. Is the rug flexible and yet sturdy? By such a close examination and comparison of different qualities you soon see for yourself what the differences are and can judge more or less whether the price difference appears to correspond to the quality difference. Look at the backings side by side to see how close the weave is.

The backing should be tightly woven in order to hold the pile fibers securely. While some sizing is desirable, there should not be too much. Loose, sleazy backing is sometimes heavily sized to give the rug the feel of

weight and strength. Such excessive stiffening is an indication of poor quality.

Flat-weave rugs may be judged also by the closeness and firmness of the weave. If cotton is present it is likely to be the weakest fiber.

As a rule, present-day dyes are fairly fast to sun. They should be clear and bright originally. A rug may be finished to have a high luster, to be semi-lustrous or with a soft dull effect. Does it reflect light or absorb it? The rug should be examined in different lights and from different angles to see whether the luster and color both give the desired effect. If the rug has a high sheen, this may have been produced by a chemical treatment. Such treatment, if overdone, has a weakening effect on the fibers.

Lift the rug to see how heavy it is and whether the fibers are sufficiently dense to account for the weight. Bend the rug back on itself so that the upper surfaces are together and observe how firm and strong the backing is and whether it is very stiff or reasonably flexible.

While examination by sight and touch furnishes no definite gauge of quality, it is about all the purchaser can do, together with checking the suggested practical points mentioned. Informative rug labeling would be a great aid to the conscientious salesman as well as to the purchaser.

(This is the first of two articles on "The Selection and Care of Rugs and Carpets.")

A Report on SAE 10, SAE 20, and SAE 30 Motor Oils

RESULTS of technical tests on a representative group of motor oils made by a West-

ern state government were the basis of the ratings in the following table compiled by Con-

sumers' Research. As in previous reports, ratings of the various oils depend upon their

viscosity index, pour point, properly labeled as to SAE number. Viscosity index has been given the greatest weight, carbon residue, and their being in the ratings.

Brand	Manufacturer or Distributor	SAE 10	SAE 20	SAE 30
All State	Sears, Roebuck & Co.	A	A	B ³
Conoco Nih	Continental Oil Co.	A	—	A
Cross Country 20-20W	Sears, Roebuck & Co.	—	B ³	—
Cyclol	Tidewater Assoc. Oil Co.	—	—	C ²
Economy	Wilshire Oil Co.	—	—	C ^{2,3} (2 samples)
E. I. Western	Wilshire Oil Co.	—	C ²	C ²
Golden Eagle	Wasatch Refining Co.	—	B ²	C ^{1,2}
Golden Shell	Shell Oil Co.	C ^{2,4}	B ²	B ²
Greenspot	General Petroleum Corp.	—	—	C ²
Hancock 100% Penn	Hancock Oil Co.	C ^{1,3}	—	—
Hancock 5 Point	Hancock Oil Co.	—	C ^{2,3}	—
Hancock Western	Hancock Oil Co.	—	—	C ²
Havoline	The Texas Co.	A	B ¹	B ³
Kendall	Kendall Refining Co.	B ⁴	—	—
Long Run	Western Auto Stores	—	C ²	—
Lubrite	General Petroleum Corp.	—	B ²	B ²
MacMillan Ring Free	MacMillan Petroleum Corp.	B ²	B ²	B ²
Mobiloil	General Petroleum Corp.	A	A	—
Mobiloil-A	General Petroleum Corp.	—	—	A
Motoreze	Union Oil Co.	—	C ^{2,3}	B ² (2 samples)
New Triton	Union Oil Co.	—	A	—
Parapet	Standard Oil Co.	—	—	C ^{1,2}
Pennzoil	Pennzoil Refining Co.	A	C ^{3,4}	A, B ³
Penn Supreme	Western Auto Stores	—	—	A
Polly Penn	Wilshire Oil Co.	—	B ³	B ³
Quaker State	Quaker State Oil Co.	B ³	B ³	A
Richfield Penn	Richfield Oil Co.	B ⁴ , C ^{2,4}	C ^{3,4}	C ^{3,4}
Richlube	Richfield Oil Co.	B ²	B ²	C ^{1,2,3} , C ^{2,3}
RPM	Standard Oil Co.	A	A	B ²
Santa Fe	L. A. Ebert	—	B ³	B ³
Shell Penn	Shell Oil Co.	B ¹	C ^{3,4}	C ^{3,4}
Shell X-100	Shell Oil Co.	C ^{3,4} , A	C ^{3,4}	C ^{3,4}
Signal Premium	Signal Oil Co.	A	A	A
Signal 4 Star	Signal Oil Co.	—	A	C ^{2,3}
Standard Penn	Standard Oil Co.	B ³	B ³ , C ^{1,3,4}	B ³
Supreme Compounded	Western Auto Stores	—	B ²	B ³
Texaco	The Texas Co.	—	B ¹ , C ^{1,2} , C ^{2,3}	B ²
Travelers	Travelers Oil Sales Co.	—	B ³	B ³
Triton	Union Oil Co.	A	—	B ³
Tydol	Tidewater Assoc. Oil Co.	C ^{2,3}	C ^{2,3}	B ² (2 samples)
Valvoline	Valvoline Oil Co.	—	—	B ³
Veedol	Tidewater Assoc. Oil Co.	B ³	C ^{3,4}	C ^{3,4}
Wards Vitalized	Montgomery Ward & Co.	—	B ²	B ²
Zerolene	Standard Oil Co.	—	C ²	C ²
Zoilube	Pennzoil Refining Co.	—	C ^{3,4}	B ³

¹Misbranded as to SAE Number.

²Viscosity index too low.

³Pour point high.

⁴Carbon residue high.

Radio Receivers, a Radio-Phonograph Combination, and Two FM Tuners

A Test of Six Portable Radio Receivers

THE tone and fidelity of any portable or table-model radio are limited, due to the small size of the cabinet and chassis used. This characteristic is also the main contributing factor in their inability to reproduce the low frequencies properly (bass notes). For these reasons, the size of the cabinet or console is necessarily an important consideration in buying any radio from which good reproduction is expected.

The *General Electric*, *Philco*, *RCA Victor*, and *Zenith* portable receivers reported on in this article each had a desirable tuned radio frequency stage, which is considered essential for loop antenna operation if satisfactory daytime reception is desired at any considerable distance from broadcasting stations. It is CR's opinion that most portable radio sets cannot be used satisfactorily as a substitute for an automobile radio, despite the fact that they have been widely advertised for the purpose. The main difficulties experienced are: (1) interference with reception caused by ignition noises; (2) lack of sufficient volume to override the noise of a rapidly moving car; (3) reduction of signal strength inside the metal car body; and (4) directional characteristic of loop antenna.

Portable Radios

A. Recommended

General Electric, Model 250 (*General Electric Co.*, Bridgeport, Conn.) \$99.50. Operates from built-in rechargeable storage battery, or 110 volts a-c. The storage battery, vibrator power-supply unit, and full-wave dry rectifier unit used in charging the storage battery are included



Front row, left to right: *RCA Victor*, Model 65 BR9; *Trueltone*, Model D-3722; *Airline*, Model 74BR-1055A.

Back row, left to right: *General Electric*, Model 250; *Philco*, Model 46-350; *Zenith*, Model 6 G001.

in the case. Chassis and case well built of cast aluminum. The battery operated the set for 15 to 20 hours on one charge with intermittent use. Sensitivity excellent, selectivity good. Had desirable radio frequency stage. Approximate audio frequency range (electrical), 35 to 4600 cycles (good for a set of this type). Acoustic quality good for a small receiver. Output at 400 cycles with 10% distortion, 0.2 watts (good for the type). Background noise least of any portable set herein reported. No shock hazard present. Chassis arrangement and accessibility for servicing exceptional among small receivers. Parts of good quality. Considered easily best of the portable sets tested, but price far above other portable sets of corresponding performance. Bore Underwriters' Label.

Philco, Model 46-350 (*Philco Products, Inc.*, Philadelphia) \$54.45; battery pack \$4.35 extra. Operates from 110-volt a-c or d-c or self-contained dry batteries. Case made of wood, covered with artificial leather. Could be used with self-contained loop or external antenna. Sensitiv-

ity excellent, selectivity good. Approximate electrical audio frequency range, 50 to 3400 cycles (poor), but acoustic quality (listening) good for small receiver. Output at 400 cycles at 10% distortion, about 0.1 watt (low). When operated on power lines, leakage current (shock hazard) was excessive, 9 ma. Accessibility for servicing, poor; quality of parts and workmanship, average. Bore Underwriters' Label. Because of high leakage current, the set warrants inclusion in the *A-Recommended* class only for those who purchase it for use with batteries.

RCA Victor, Model 65 BR9 (*Radio Corporation of America*, Camden, N. J.) \$89.95. Like *General Electric*, Model 250, operates from built-in rechargeable storage battery or a-c. Wooden cabinet with plastic front. The storage battery and charger with dry rectifier constitute a unit. Battery operated the set from 15 to 20 hours per charge with intermittent use. Sensitivity good, selectivity excellent. Approximate electrical audio frequency range, 55 to 2000 cycles (very low range). Output at 400 cycles at 10% dis-

tortion, 0.1 watt (low). Leakage current (shock hazard), 2.2 ma. (rather high). Set was well constructed but considered a less desirable buy in several respects than the *General Electric*, Model 250. Bore Underwriters' Label. 3

B. Intermediate

Airline, Model 74BR-1055A (Montgomery Ward & Co., Chicago) \$36.30 including battery pack. Replacement battery pack \$3.49. For 110-volt ac-dc or battery operation. Wooden case covered with artificial leather. Could be used with self-contained internal loop or external antenna. Sensitivity and selectivity fair. Lacked the desirable radio frequency stage present in 4 of the sets in this group. Approximate electrical audio frequency range, 30 to 4500 cycles (good for a set of the type). Leakage current (shock hazard), 9.0 ma. (excessive). Bore Underwriters' Label. Might be a fairly good buy for the non-critical user who requires a portable set at a moderate price. Because of shock hazard, not recommended for use on 110 volts. 2

Zenith, Model 6 G001 (Zenith Radio Corp., Chicago) \$54.60; battery pack \$3.74 additional. For 110-volt ac-dc or battery operation. Aluminum case, covered with artificial leather. Sensitivity and selectivity good. Approximate electrical audio frequency range, 75 to 3000 cycles (poor). Leakage current (shock hazard), 3.7 ma. (somewhat excessive). The detachable "Wave-magnet" loop antenna used with this set was not considered an important advantage. Bore Underwriters' Label. Considered a poor buy in comparison with the *Philco*, Model 46-350, at about the same price. 3

C. Not Recommended

Truetone, Model D-3722 (Western Auto Stores, Inc., Kansas City, Mo.) \$32.95; battery pack \$3.75 additional. Operated on 110-volt ac-dc or batteries. Wooden case covered with artificial leather. Sensitivity and selectivity fair. Serious shock hazard present (one side of power line connected directly to chassis). Quality of workmanship below average. No Underwriters' Label. 2

A Table-Model AM-FM Radio Receiver

C. Not Recommended

RCA, Model 68R3 (Radio Corporation of America, Camden, N. J.) \$50.56. 105 to 125 volts, 60 cycles. A table-model combination AM (broadcast range) and FM receiver. Superheterodyne circuit with 8 tubes, including rectifier. 5 by 7 in. oval permanent-magnet speaker used. Manual tuning. Sensitivity of FM section, fair; of AM, good. Selectivity of both AM and FM, good. Power output 0.52 watt at 400 cycles, 1.2 watts at 5000 cycles, measured at 10% distortion (not good—output at 400 cycles should at least equal output at 5000 cycles). Approximate acoustical range 150 to 5500 cycles. FM detector circuit was not altogether effective in eliminating amplitude modulation noise, and there was considerable distortion on FM. The tonal quality on FM was little better than the average small AM receiver, hence receiver was not considered a desirable type of AM-FM combination. On listening tests, the receiver sounded fairly well at low volume levels, but weak reproduction of low-frequency tones was very evident. 2

Console Radio-Phonograph Combination—AM

(NON-HIGH-FIDELITY TYPE)

A. Recommended

Westinghouse Opera Grand, Model H-110A (Westinghouse Electric Corp., Sunbury, Pa.) \$260. For use on 105 to 120 volts. 60-cycle a-c. A 7-tube (including rectifier) superheterodyne circuit which covered the standard broadcast band and the short-wave band from 5 to 18 mc. Cabinet was of mahogany veneer construction, and well built. Manual or push-button tuning. Speaker, 10-in. dynamic. Record changer capacity, twelve 10-in. or ten 12-in. records. Automatically shut off when last record had been played. Needle pressure, 1 to 1½ oz. on different samples (1 oz. desirable). Accessibility for servicing, good. Sensitivity, good; selectivity, on broadcast band, good; on short wave, fair.

No spurious responses were noted. Tonal range exceptionally good, 60 to 15,000 cycles when phono input was used; with radio input, 60 to 4600 cycles. Power output at 10% distortion: 3.6 watts at 80 cycles, 9.1 watts at 400 cycles, 12.3 watts at 4000 cycles, 11.0 watts at 8000 cycles, rather good for a set of this grade and price level in today's market. Three different sets of this model were tested and considerable variation was found in the response readings. The above rating does not apply to those models using a 6AT6 tube (audio driver). 3

Console Radio—AM-FM

C. Not Recommended

Midwest, Model 716A (Midwest Radio Corp., Cincinnati) \$99.50 without cabinet. For use on 105 to 125 volts, 60 cycles a-c. A combination AM and FM receiver, with 12-in. electrodynamic speaker. Superheterodyne circuits used, with a total of 16 tubes, including rectifier and tuning indicator. Covered the broadcast band from 540 to 1600 kc., the short-wave bands from 1.6 to 22 mc., and the 87 to 109 mc. FM band. Both manual and push-button tuning. Effectiveness of automatic volume control, poor. Sensitivity poor for FM, excellent for other bands. Selectivity good on all bands. Measured power output for FM: 0.7 watt at 65 cycles, 9.1 watts at 400 cycles, 8.5 watts at 5000 cycles, all at 10% distortion (fairly good). Maximum power output, 14.5 watts at 28% distortion. Approximate acoustical range for FM, 68 to 6000 cycles (inadequate). The audio amplifier, alone, gave an exceptionally flat response curve from 70 to 20,000 cycles. Quality of workmanship and parts, average; accessibility for servicing, good. No Underwriters' Label. Although the performance and tone quality on AM compared favorably with higher-priced receivers, the FM section was inferior. There was considerable drift of tuning noticed, a common failing of FM receivers made for the new 88 to 108 mc. band; on this account it was necessary to retune the FM part occasionally. 2

High-Fidelity AM-FM Radio-Phonograph Combination

A. Recommended

Fisher, Model C-1201-A24 (Fisher Radio Corp., 41 E. 47 St., New York) \$1125 in "Chadwick" period cabinet. For use with 105 to 125 volts, 60 cycles a-c. Full-size console model for AM or FM use. Was equipped with *Webster-Chicago*, Model 70, automatic record changer, and used the *General Electric Variable Reluctance* pickup (very desirable for the purpose). Speaker was a *Stephens Trusonic* coaxial, 15 in. in diameter. Superheterodyne circuits used, with 23 tubes, including rectifiers, tuning indicator, and voltage regulator tube. The AM tuner covered the broadcast band from 540 to 1600 kc., and the 6 to 18 mc. short-wave band. The FM tuner covered the new 88 to 108 mc. band only (satisfactory). There were 3 audio channels: one for the *General Electric* magnetic pickup, a second with compensating circuit suitable for a crystal pickup, and a third for television sound. Sensitivity and selectivity both excellent. Power output as measured exceptionally good; 21.5 watts at 50 cycles, 23 watts at 400 cycles, 10 watts at 5000 cycles, all measured at 5% distortion. Maximum power output, 31 watts at 14% distortion. Approximate acoustical range, good, 70 to 11,000 cycles (substantially flat response). Quality of workmanship, average; quality of parts, average, with resistors and transformers above average. No shock hazard found. This set is rated *A. Recommended* in the high-fidelity class but the rating does not apply to the cabinet, which was not considered to be of satisfactory design and finish. The chassis is available in other period cabinets at higher prices. This set can be purchased equipped with the *Jensen HNP* speaker at a lower price; listening tests indicated that that would be the preferable combination. 3

Two FM Tuners

Pre-war FM adapters (called "translators" by the General

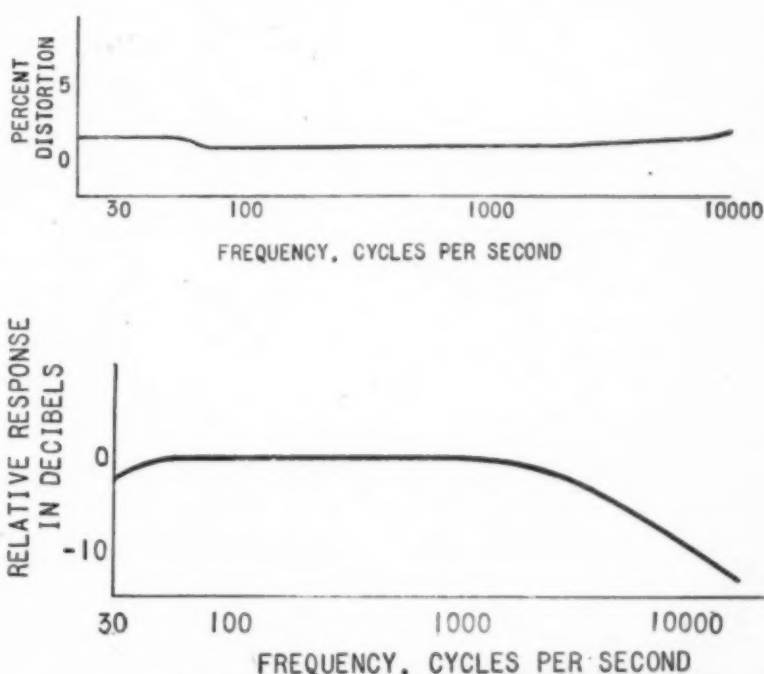
Electric Co.) are not suitable for use on the present frequency band (88 to 108 megacycles) and it is doubtful whether it would be economical in any case to convert to the new band a tuner originally designed for the old 42 to 50 mc. band, because of the difficult design problems which have been raised by the governmental order switching FM to 88 to 108 mc.

A tuner is what might be called the "front end" of a radio receiver. It is the part which takes the very weak signal "out of the air," steps it up, converts it to higher electric voltages at audio (sound) frequencies, and delivers it to an amplifier (which steps up the signal further so that it can be utilized by a loud-speaker). A tuner is usually part of an existing radio receiver, but it can be an accessory which is to be connected

to the "rear end" or output stages of an existing radio receiver so as to function instead of the tuner that was present in that equipment. Alternatively, it can be used without a radio receiver by persons who already have a power amplifier purchased or constructed for use in connection with a phonograph turntable and pickup.

In most cases the FM tuners covering the post-war frequency range have been priced so high as to be almost prohibitive to the average consumer. Prices, indeed, are as high in some cases as was charged for a fair to moderately good complete radio receiver in the period before the war (the *Browning Universal* [AM-FM] tuner at \$143.90, for instance, and the *Collins* [AM-FM] tuner at \$175, net).

The first of the two FM tuners reported in this article is something unusual at this time, as it was priced at \$29.95, or only a little over half the price



Electrical fidelity and distortion characteristics of the Pilotuner. The upper graph shows harmonic distortion at various frequencies—22.5 kc. deviation, 100 mc. center frequency. The zero line omitted through error in the upper diagram is a line parallel to the base line and beginning at the zero next to the words Percent Distortion.

charged by General Electric Co. for their pre-war "translator." The moderate price, combined with the fact that the tuner actually works well and makes high-fidelity reception possible for people who have good audio-amplifier equipment should go a long way toward making FM reception available to many who would otherwise have had to postpone their purchase. (It must be kept in mind that there is at least a possibility that the FM wave band will go back to its earlier figure—or that both wave bands may be permitted—on account of the serious difficulties manufacturers have been having with construction of tuners for the new frequencies.)

There are important considerations that the consumer must have in mind before purchasing an FM tuner unit. The primary advantage of FM reception is its comparative noise-free, broad-band reception, permitting reproduction of a full range of frequencies (high fidelity) which are not practicable for amplitude modulation (AM) equipment. Thus, the use of high-fidelity FM equipment to deliver a signal to the output stages of a small table-model or any poor or mediocre console-model radio would not be justified because, although reception might often be much clearer and at least free from static, tonal quality of reproduction would still always be limited by the quality of the audio amplification in the output stages of the receiver. That quality is never good enough in an ordinary receiver to warrant use of a high-fidelity "front end" or tuner equipment ahead of the amplifier. The best quality console radios with phonograph equipment, which sell in the region

of \$500 to \$1000, are none too good for use with FM, but high-fidelity audio-amplifier equipment can be bought for around \$150 which is good enough to go with the high-fidelity reception obtainable with a good FM tuner. (At present, high-fidelity equipment is hardly worth bothering about with AM broadcasting, for today's AM quality is rarely good enough to warrant one's going to any trouble to obtain and use high-fidelity equipment in reproducing it.) One should add that *at the moment* FM programs are, for the most part, not good enough to cause anyone to be particularly concerned about its high-quality potentialities, as most of the programs are the playing of records of ordinary grade, often well worn, and like AM broadcasting, calling for no specially good equipment at the receiving end. As to FM, however, this situation should not continue indefinitely, and there will undoubtedly be fine "live" FM broadcasting to be heard (as there was before the war) when Mr. Petrillo of the Musicians' Union takes his heavy economic controls off the FM broadcasting situation.

A. Recommended

Pilotuner, Model T-601, FM Tuning Unit (Pilot Radio Corp., Long Island City 1, N.Y.) \$29.95. For a-c operation only (desirable). A table-model FM tuner mounted in a small walnut finished cabinet which measured a little less than 7 x 9 x 6 in. A superheterodyne circuit was used which employed a selenium rectifier in the power supply, a 6BA6 radio frequency amplifier, a 6BE6 mixer-oscillator, two 6BA6's as i.f. amplifiers, and a 6AL5 as ratio detector. Contained an internal loop antenna usable for homes quite close to the broadcasting station and provided for connecting an external antenna where needed (which would be the normal situation). Electrical fidel-

ity 20 cycles to 9000 cycles, considered very good. Harmonic distortion less than 2% between 20 and 10,000 cycles. Sensitivity considered good enough for most FM listening. Each of three *Pilotuners* worked well in a location at a distance of about 50 miles from a number of broadcasting stations. (The performance of the three on broadcast reception was quite uniform, indicating good control of manufacturing operations.) Where there is doubt as to reception, as there will be in localities distant from major FM broadcasting stations, purchaser may be able to obtain the tuner on a money-back basis that will allow one evening's trial in his own home with a temporary dipole antenna. (An ordinary radio antenna will not provide a satisfactory test.) Workmanship and parts equivalent to those found in higher-priced equipment. Station drift (a failing of many low-cost FM tuners) not noticed during operation. As fully explained in the text, the *Pilotuner* will achieve its greatest usefulness only when operated in conjunction with a good quality audio amplifier and speaker system capable of reproducing all frequencies at least from 75 to 7500 cycles. Complete directions for installation and servicing were included. If the set with which this tuner is to be used does not have external connections on the chassis providing for connection of the FM tuner output, a competent radio serviceman can make the necessary connection. Carried Underwriters' Label. 1

B. Intermediate

Edwards FM Tuner (Edwards FM Radio Corp., 168 Washington St., New York 6) \$52.50. FM tuner chassis only (no case), somewhat larger than *Pilotuner*. A-c only (desirable). Superheterodyne circuit using 8 tubes including rectifier and tuning eye. Phono input connection and phono-FM switch, desirable features. Volume control included (desirable). Sensitivity considered good enough for most FM listening. Mechanical construction, fairly satisfactory. Harmonic distortion, very low—less than 1% between 50 and 10,000 cycles. Limiter action not as effective as that of the *Pilotuner*. 2

Note: For further information on the problem of FM tuners, see CR BULLETINS for November 1941 and June 1942 (30c each).

★ ★ ★ ★ Spred Luster ★ ★ ★ ★

A COMPARATIVELY new type of paint, called *Spred Luster*, has recently been marketed. It is a widely-advertised paint of the synthetic resin emulsion type, the type which became very popular during the period of shortage in the supply of linseed and other drying oils. A test of this paint conducted by CR indicated that *Spred Luster* could be easily thinned with water as the directions stated and that it brushed easily at normal spreading rate. As applied, this paint had rather high hiding power, but its hiding power after it was dry was somewhat low. (This effect is just the opposite of that which is noted with a good oil paint, which usually shows better hiding power as it dries.) *Spred Luster* produced a very hard coat after drying, and this coat was quite brittle. When used to cover a previously painted surface which was showing slight cracking, it did not fill the cracks very well, and its surface was not quite smooth, compared with regular wall enamel. However, it did not produce a cracking or peeling surface itself during the test.

While being applied and while drying it gave off very little odor and dried rapidly. (In fact, unless care was taken, it showed lap marks for this reason, when painting up to a surface which had only been painted a minute or two previously.)

When samples were marked by various staining materials, it was found that marks made by a lead pencil (graphite), a fountain pen ink, and black India ink were easily and com-

pletely removed by washing, without any observable wearing away of the paint and without any alteration in the smoothness of the surface. An exception, however, was with a severe type of stain made with iodine. The removal of this required the use of an abrasive which altered the surface thickness and gloss. The painted panels were judged to wash as well as the average

semi-gloss wall paint, made of the usual ingredients with linseed oil.

Although the label on the can said that warm soapy water would do a good brush-cleaning job, it was found necessary to use mineral spirits after first washing the brush in the soap and water.

Finally, age tests, which were made to determine color fastness, showed that yellowing took place at a faster rate with this paint than with a good wall paint.

CR feels that *Spred Luster* which is said to require "no undercoating or sizing," coat, does not give as satisfactory a job as wall primer and semi-gloss paint of the usual oil type. It may be somewhat less expensive in use due to present shortages and high prices of paint materials. However, for the general run of interior house painting, where the highest standards of quality are not necessary, particularly on surfaces rather poorly adapted to high-grade painting, such as wallboard, *Spred Luster* seemed to be a very practical paint and it would have the decided advantage over some other types of paint that it can be brought back to its original good appearance by washing several times, unless it had been stained with one of the more difficult stains. It is not possible to say at this time whether this paint will stand up well over a long period of years.

B. Intermediate

Spred Luster (The Glidden Co., Cleveland, Ohio) \$4.98 per gal. (makes 5 qt. when thinned). Available in 11 different shades.

Please. . .

Be patient. As this goes to the printer, it is only the last week in September, but already our mail looks like the mail-order division of a big-city department store the week before Christmas.

Even if it were possible to secure on short notice help of adequate competence to handle orders and correspondence as promptly as we should wish, we wouldn't have space for desks and other office equipment for them. Our earlier plans for expanding our present quarters could not be carried out, because of governmental restrictions on building and today's prices for building materials and labor make new construction of office space impracticable at the present time.

We ask you to keep in mind the fact that, because of the rush of orders, it will often require at least four weeks to complete the processing of a subscription order after it is in our hands, and to send the initial material.

The answering of requests for information may at times require as long as three to four weeks. The inquirer will facilitate the handling of such requests if he will enclose a stamped addressed envelope for reply.

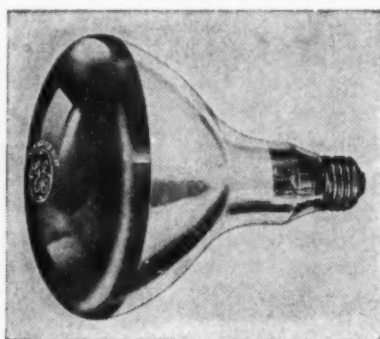
Infra-Red Heat Lamps

AN infra-red heat lamp is, in essence, nothing more than a source of radiant heat energy. That such lamps usually give also a certain amount of visible light energy is only incidental. The chief difference between this heat energy and light energy is a matter of the wave length of the radiations. However, the infra-red lamp usually is so designed that a greater proportion of its energy is radiated as heat than is radiated in that form in the case of lamps built for the purpose of giving light, primarily.

The infra-red region of the wave length spectrum is normally considered to cover the range from about 8000 A.U. (angstrom units) to somewhere around 1,000,000 A.U. At 8000 A.U., the radiation is just beyond the extreme red end of the visible spectrum, while at 1,000,000 A.U. (0.01 cm.) the energy emission borders on the ultra-high frequency radio range. Among familiar heat sources, the usual incandescent lamp reaches its maximum rate of energy radiation at about 10,000 A.U., sunlight at about 5000 A.U., while the steam radiator used to heat our homes reaches its maximum point of energy radiation at above 50,000 A.U. The infra-red heat lamps now being offered for use by the public reach their peak radiation at about 12,000 A.U.

These radiations, though invisible, behave in much the same general manner as visible light, though certain substances may react differently to them. For instance, some substances will transmit a high percentage of visible light but only a small

proportion of infra-red energy. Special glasses now are available which do just this. Ordinary window glass will transmit a large part of the shorter wave length infra-red in sunlight, but this same glass will transmit only a small percentage of the longer wave length radiation such as that given off by your steam radiator. Rays of infra-red radiation may be reflected in a manner similar to visible light; polished metal reflectors are most efficient for this purpose. Similarly, infra-red rays may be bent or refracted by prisms or lenses. Demonstrations have shown that a lens



Courtesy General Electric Co
Type R40 Infra-Red Lamp

of ice may be used in this manner to converge these rays and even to set fire to materials at the focus of such a lens. Special film has been developed which makes it possible to take pictures through cloud and haze by means of infra-red rays.

The rays themselves are not hot, but when they are absorbed their energy is turned into heat. Passing through air or through a proper lens there is little heating of the air or the lens, but where the rays finally fall on a body which will absorb them the heat is released. When reflected from a surface,

only a small part of the energy may be absorbed by the reflector with consequent low release of heat at the point of absorption. For this reason, radiant heat energy as such has found comparatively little application in the heating of homes in the United States, where it has been the practice to warm the air of the room in order to produce the sensation of comfort, rather than to apply heat directly to the body as is done by the radiation from a fireplace (or a hot stove) in a cold room. The devices which we commonly call radiators really *radiate* comparatively little of their heat energy into the room; they transfer most of it to the air of the room *by convection* (heat transfer by air motion).

However, we have known radiant heaters in various forms. The caveman's open fire, and the more modern open fireplace are the oldest and best known. These give a good illustration of radiant heating effects in that the side of the body that is turned toward the fire is heated, while those parts not so exposed to the infra-red rays may be quite chilly. Another well known form of radiant heater is the so-called "sun-bowl" type in which an electric heater is placed at the focus of a polished metal reflector. Those who have used this type of heater will recall an action similar to that from the open fireplace.

The open fireplace, with a roaring hot fire, will radiate a tremendous quantity of heat into the room to be absorbed by those objects in the path of its rays. The "sun-bowl" types of heater have usually been

supplied with heaters ranging from 500 to 1000 watts in power consumption. The infra-red heat lamps now being offered are supplied in 250- and 375-watt ratings. One cannot, of course, expect a unit with so small a watt rating to deliver the amounts of radiant heat energy available from the high-power sources.

The chief advantages of the infra-red heat lamps lie in their convenience and ease of handling or application. These lamps in a small unit comprise a source of infra-red radiation and a fixed metal reflector behind it. This unit may be operated from any lamp socket and is light enough in weight that it may be directed by hand or any form of stand at any desired target. Except for the socket, the lamp is a complete unit in itself. It is not necessary to buy or provide a special stand or reflector for use with it.

Being a lamp, the unit is in a glass envelope and is therefore subject to certain limitations. One of these is fragility—a sharp blow will crack or break the glass and thus render the lamp inoperative. Most of the lamps are made with ordinary glass bulbs and while in use must be protected from contact with splashing liquids or cold metallic bodies. Such a contact, accidental or otherwise, may crack or shatter the bulb. (Some lamps are made with hard glass envelopes which will to some degree resist such action.) Due to these conditions it is desirable *never to use the lamps, unprotected, directly above anything which might be injured by falling pieces of hot glass in case the lamp should break.* Protection may be provided by means of a screen of wire mesh between the lamp and the subject

being irradiated.

Certain Federal Trade Commission rulings make it no longer permissible to advertise infra-red lamps as a cure for bodily ailments. It is permissible, however, to advertise the lamps, as for therapeutic use under the direction of a physician or for use to ease pain where the application of heat may be indicated. In spite of these rulings, some lamp cartons still will be found to carry unwarranted advertising statements, such as the following:

Quick temporary relief from ache and pain. . . .

Use following over-exertion or fatigue. . . .

A disk around the neck of the lamp when examined in its original carton, however, usually reads more or less as follows:

This lamp is designed for use as a source of infra-red radiation. The manufacturer, however, makes no claims as to the effectiveness of this radiation for the maintenance of health and particularly for the cure of disease, the latter being entirely the province of the medical profession. It is specifically recommended that skin areas affected by anesthesia, or where circulation be impaired, not be exposed to the radiation of this lamp. Although this lamp was made with exacting care from selected materials and was carefully inspected before shipment, the glass bulb may crack or shatter under certain conditions beyond the control of the manufacturer. When this lamp is used for therapeutic purposes, suitable protection, such as a wire glass screen, should be placed between the lamp and the patient.

Since there is considerable heat radiation in the beam of this lamp, care should be taken against using it in close proximity to combustible materials or those adversely affected by drying action, without suitable protection.

There is no doubt but that the lamps will serve many useful purposes in the home and in industry. They are useful for

the relief of pain *where the application of heat is a proper method of treatment.* They can be so arranged that this heat is readily directed to the affected part in an efficient manner. During such use care must be exercised that nearby combustible materials are not overheated (even ignited), or that as a result of the patient's falling asleep, the lamp is not possibly put into a position where it can do harm or start a fire in curtains or bedding.

In applications around the home, the lamps form a convenient source of heat directly applied, since the heat appears where the radiation is absorbed. When a single lamp is used, which is what most advertising would indicate as sufficient, there is a very definite limitation due to the relatively low watt rating and the fact that, necessarily, only a fraction of this input is brought to bear on the target. Lists of claimed home uses include: (1) defrost refrigerators; (2) heat the bathroom, kitchen, or workshop; (3) warm up cold automobile motors; (4) dry film and prints; (5) thaw frozen pipes; (6) melt grease in clogged pipes; (7) remove old paint and putty; (8) de-flea the cat, delouse the dog; (9) dry clothes or dishes; (10) dry glue, paint, or plaster; (11) warm brooders; (12) speed up drying of fingernail polish; (13) dry hair after washing; and (14) dehydrate foods.

An infra-red lamp, properly and carefully used, may help in most of the above operations, but it may be found that the time required in application will be unduly long or that there are other factors of importance. It has been indicated in some advertising that with a lamp a refrigerator can

be defrosted in 5 minutes. This is a possibility, at least with some makes of refrigerators, but only a possibility, as the amount of ice to be melted in the defrosting is a determining factor; if all of the heat developed by a 250-watt lamp could be brought to bear on a single pound of ice, it would take nearly 10 minutes to melt it.

For heating the kitchen, bathroom, etc. (referred to as one of the uses of infra-red lamps), a lamp would supply heat to that side of a body which is turned toward the lamp. The use of several lamps, so located as to deliver heat to the body from all sides would be necessary if comfort was to be achieved in a cold room. The cost of operation might then be a factor as electric heating is a costly way of heating in cold weather.

To warm up a cold automobile motor might require in cold weather that a lamp be left on overnight or at least for several hours. This might involve a danger element in that the heat would be applied directly to the surface receiving the radiations. Should this surface be coated with oil or should a drop of gasoline fall on the lamp, a fire might be started. In any event harmful local temperatures might be produced, even though the body of the engine had not yet been heated through. It would be necessary to keep the lamp at such a distance as to prevent any excessively high local temperature from being attained, and this would, of course, slow the entire warming process greatly.

A similar condition would exist in drying film. Heat will increase the rate of evaporation of water from the film, but when this method is used, it

may be necessary to watch the film very closely to prevent damaging it.

For thawing frozen pipes, the infra-red heat lamp is not without its danger of setting a fire, but is far less dangerous in this respect than the blowtorch commonly used; it is, of course, slower in action. A similar condition will be found in the removal of paint and putty; the lamp is safer but slower than the torch.

In drying clothes, dishes, or hair, heat is helpful, though caution must be shown in the use of the lamp due to the danger from water particles striking the glass. In each of these cases, however, drying is done most effectively when heat is combined with moving air to carry the vapor away. This would suggest the use of a fan with the lamp, or even of a fan-type electric heater, which is available in ratings up to 1320 watts, where electric drying is desirable. Similar disadvantages may be found in other uses of the lamp for drying operations. The one advantage offered by the lamps for these uses is that much of the heat delivered is delivered upon the surface of the body irradiated and not to the surrounding air.

For certain applications, lamps are offered with red glass bulbs. These bulbs can only *absorb* certain portions of the radiations; they cannot in any way add to the radiation available. They are therefore somewhat less efficient radiators, though their red color may give the psychological effect of a heater, rather than a lamp, because of reduced visible radiation, and glare will be less annoying.

The infra-red lamp will often be helpful where localized heat

is needed, but it should be used with knowledge of at least some of its limitations and risks of injury or the fire hazard that may be involved.

There are many radiant heat sources available commercially, though a goodly number of these are designed and built for special applications. For instance, there is a line of lamps of various ratings made for industrial uses; another group is put out especially for professional use in heat therapy; there are also heat sources for miscellaneous uses in the home. The listings which follow include only those infra-red sources of the latter type.

Lamps for Home Use

Lamps Without Stands

A. Recommended

Type R40 Infrared Heat Lamp. A tungsten filament lamp designed as a radiant heat source and incorporating an efficient metallic reflector in the lamp bulb. Operates from the usual 110 to 125 volt lighting circuits and may be burned in any position. *No special stand or holder required.* Life of lamps, about 5000 hours. Available in two types, one of clear glass (with a light inside frost) and the other with a colored (red) glass bulb. The red glass bulb usually is of hard glass and will resist cracking or breaking due to possible splattering with liquid. The red glass also serves to absorb some of the visible radiation and hence to reduce glare.

Manufacturers of Type R40 Lamps:

Sylvania Electric Products, Inc., 125 watt, clear glass, \$1.50; 250 watt, clear glass, \$1.60.

General Electric Co., 250 watt, clear glass, \$1.70; 250 watt, red glass, \$2.95 (Montgomery Ward's Cat. No. 86-1667 L).

Westinghouse Electric Corp., 250 watt, clear glass, \$1.65 (Sears-Roebuck's Cat. No. 20-7107, \$1.25); 250 watt, red glass, \$3.50 (Sears-Roebuck's Cat. No. 20-7111, \$2.95).

Penetray Corp., Toledo 5, Ohio, 250 watt, ruby glass, \$3.60.

Lamps With Stands

A. Recommended

Montgomery Ward's Cat. No. 86—1700 L. \$2.25. A small device for the local application of radiant heat for extremely localized heat therapy. Uses a clear 15-watt tungsten lamp in a holder designed to concentrate the rays through a 2-in. circular opening. For use on 110 to 125 volt supply lines. Life of lamps, about 1200 hours.

Sears-Roebuck's Cat. No. 20—7124.

\$2.89. A clamp-on type lamp holder and clear bulb 250-watt R40 heat lamp. The aluminum reflector of the holder serves no purpose other than as a guard to prevent touching the lamp, since lamp bulb has its own reflector.

Sears-Roebuck's Cat. No. 20—7123.

\$4.69. A simple and convenient holder (though offering no protection against touching the lamp) for the use of heat lamps around the home. 20—7111 lamp (see under *Westinghouse*, p. 22, col. 3) included.

B. Intermediate

Montgomery Ward's Cat. No. 86—1725 L. \$7.95. This lamp consists of an open heating element in a polished metal reflector. Made by Knapp Monarch and rated at 300 watts. An adjustable stand serves to direct rays where wanted.

Prometheus Infra Red Lamp, Model 201 (The Prometheus Electrical Corp., 401 W. 13 St., New York 14) Resistance wire heater embedded in a ceramic material. Rated at 550 watts.

DAB and WYPE—Two New Automobile Enamels

NOWADAYS very few people paint their own cars, but the cost of professional spray painting of an automobile has gone up to such a high figure that the possibility of cutting this cost very greatly will appeal to many. Two new products which have recently appeared on the market, one called *DAB* and the other *WYPE*, offer considerable promise in this respect, as their application does not require any special technique, and the results seem very good indeed for amateur painting. If the simple directions given on the packages (except as noted below, for *DAB*) are followed and reasonable care is used, a very nice job, though one that does not equal that of a professional body finisher, can be obtained.

The products are of high quality and appear to be well suited for the purpose for which they are offered. Durability tests, which would require considerable time, have not been made, but on the basis of accelerated tests, which are indicative but not certain as to the future behavior of the paint materials, both would appear

to have considerable expectancy of satisfactory life. The products are preferably applied with a powder puff, and when this is done, the enamel (that of a blue color was used) was found to go on easily and quickly. The laps picked up well, the material flowed out smoothly, dried quickly, and produced hard coatings with good gloss, hiding power, and good appearance.

They should, of course, be applied in an atmosphere free from dust. While the directions for *DAB* called for the use of a piece of cloth padded as an applicator, a powder puff, which came with the paint, was found to be much the best means for application. One should make an effort to apply the products rather generously, as, when the powder puff method is used, there is a tendency to apply the paint a little too thinly.

The instructions for *DAB* call for two coats, the second being applied after 48 hours and after sanding the first coat with No. 400 or No. 600 wet sandpaper and water. Both products are "guaranteed for 2 years" which, it is safe to as-

sume, means only that in the event of failure, a new can of paint would be supplied. These products, almost identical in characteristics and behavior in CR's tests, may be worthy of an *A-Recommended* rating, but this opinion should be regarded as tentative in view of the fact that data on long-time durability or fading tests are not available, and cannot be until considerable time has elapsed. CR will be glad to hear from users of these products.

A. Recommended (tentative)

WYPE (*WYPE* Corp., Department 41-J, 2214 Dolman St., St. Louis 4) \$3.95 per qt. Had the same qualities as *DAB*, in fact products were so similar in painting properties that they might have been made by same manufacturer. (*WYPE* was priced much lower, however.) Available in 8 colors, described by manufacturer as Brewster-Dark or Jewel-Light Green, Washington-Dark or Monticello-Light Blue, Gray, Red, Maroon, and Black. 2

DAB (*Armolite* Co., 3339 E. Pico Blvd., Los Angeles 23; distributed by Nu Way Paint & Supply Co., Inc., 310 Lincoln Ave., NW, Canton 3, Ohio) \$5.95 per qt. Claimed to be sufficient to paint one car. Available in colors described by the manufacturer as Washington Blue, Monterey Blue, Brewster Green, Black, and Maroon. 3

Heating with Cold Water—

Potentially Important New Development for Heating and Cooling the Home

By ALLEN R. GREENLEAF

THE possibility of heating houses by means of the so-called *heat pump* has been recently the subject of some publicity in the popular and technical press. Although this method was proposed and some experimental work on it begun at least 15 years ago, its development still is in the early stages. A number of successful installations have been made, however, and the method, if soundly developed and promoted, promises to become one of importance to many householders.

While the statement that a house "can be heated with cold water" sounds revolutionary, the heat pump in fact represents only the extension to the heating of buildings of the principles of compression refrigeration. A refrigeration system consists essentially of an evaporator, a compressor, and a condenser. A refrigerant in liquid form expands in the evaporator to the gaseous state, and in so doing absorbs heat from and therefore cools the surrounding space. When the gas is compressed by the compressor and forced into the condenser, it reverts to the liquid form, and the heat which it absorbed while in the evaporator plus the heat equivalent of the mechanical energy supplied by the compressor is given off through the medium of a condenser to the surrounding space. Thus, while the region around the evaporator is cooled, the space around the condenser is heated. In this manner one space has been refrigerated and, although seldom noticed, another heated, simultaneously, with a total expenditure of energy from the power source (electric lines) equal only to that supplied to the compressor.

It is a relatively easy matter to

arrange a system in such a way that the same installation can be used both for *cooling* the house during hot weather by making the air of the rooms the source from which heat is drawn, and rejecting the heat to the outside air or a water source, and for *warming* the house during cold weather by a reversal of the process. Accomplishing this requires only the use of an appropriate set of valves. Presumably this dual operation will be featured in any equipment offered commercially. The heat pump arrangement makes it possible to provide house cooling, house heating, heating of the hot-water supply, and all refrigeration requirements of the home, with a single unit. This type of installation can, of course, be expensive, and certainly will be until a long period of development work has been carried out and manufacturing and installation techniques have been mastered; but ultimately and after at least several years, the cost should come down to a reasonable figure.

The cycle on which the heat pump operates is the reverse of the cycle by which heat energy is converted into mechanical energy in such a heat engine as the steam engine or a gasoline engine (internal combustion motor). The maximum efficiency theoretically obtainable from any heat engine is indicated by the fraction $(T_h - T_c)/T_h$, in which T_h and T_c are respectively the maximum (hot) and minimum (cold) temperatures over which the cycle is operated. Temperatures are expressed in terms of the Absolute Scale; absolute zero on that scale is equal to minus 460 degrees (-460) on the Fahrenheit scale, minus 273 degrees (-273) on the

Centigrade scale. From the above it can be seen that the efficiency of a heat engine increases as the difference between the maximum and minimum temperatures involved in the operation is increased.

When the cycle is operated in the reverse sense, to convert mechanical energy into heat, the ratio $\frac{\text{heat delivered}}{\text{heat equivalent of energy input}}$ is called the *coefficient of performance*; it is always greater than unity. The coefficient of performance is equal also to the reciprocal of the fraction which indicates the efficiency of a heat engine, or $T_h/(T_h - T_c)$. It is therefore evident that when mechanical energy is to be converted into heat, it is advantageous to have the least possible difference between the two temperatures. For example, it may be desired to heat a house to 72°F (532° absolute) by pumping heat from the outside air which is assumed to be at 10°F (470° absolute); the theoretical coefficient of performance is $532/(532 - 470) = 8.6$. This figure of 8.6 (or 860%) is therefore the apparent efficiency of operation of the heat pump. The objection sometimes raised that this controverts the law of conservation of energy of course is not valid—the heat pump does not *create* energy, but raises it from a low level to a higher level at which it can be utilized, somewhat as a step-up transformer raises electric voltage, but does not increase the amount of electrical energy available.

The theoretical maximum coefficient of performance cannot be realized in actual practice because the temperature must be raised above the desired level in order to provide an adequate gradient, and because of the losses in the compressor and other mechanical parts

of the system. At the present stage of development, the actual figure is likely to be between 40% and 60% of the theoretical, so that the coefficient will lie between 3.5 and 5, approximately. This means that heating by direct combustion of fuel, or by application of electric energy to a resistance heater, would require from 3.5 to 5 times as much energy as would be required by the heat pump for the same heating job. Thus there is a saving of from about 70% to 80% of the cost of operation, if comparison is made between heat-pump heating and electrical resistance heating. (It is necessary to bear in mind in this connection that electrical resistance heating is too expensive to be possible for most users, and the cost would not be comparable with the cost of heating by anthracite coal unless the cost of electricity were about one-eighth of the price at which electricity is sold, on the average, in the United States—3.5 cents per kilowatt-hour.) (Anthracite, like oil, is one of the most expensive fuels in common use, hence its use here as a basis for comparison.)

An industrial plant making use of the heat pump has a number of sources for heat in large amounts that would not be available to the home. These include: condenser water from steam prime movers, water or other liquids wasted from manufacturing processes; warm water exhausted from cooling systems used for cooling machinery, in addition to natural sources.

For heating a dwelling, available sources of heat usually include only outdoor air, the earth, or water from wells, rivers, and lakes. Because operation of a heat pump is not practical if the source is at a temperature below about 10°F, the air can be a satisfactory heat source only in mild climates. The earth undoubtedly constitutes the most reliable and generally available source of heat. Physical characteristics of the earth may vary widely from place to place, however, and this variation should be taken into consideration when de-

termining the method of heat transfer which would be most effective at the location under consideration. Presumably circulation of water through a loop or network of pipes, or through buried tanks, could also be used. Although some investigations are under way, few data are available concerning those methods.

The most practical heat source immediately available appears to be ground water. The temperature of ground water anywhere in the United States seldom if ever is below 47°F in the coldest weather, and is fairly uniform throughout the year; wells, therefore, can be an excellent source of heat for a heat pump. To avoid lowering the water table by drawing water from a well and wasting it, water may be circulated through a closed loop or pipe placed in a well of sufficient capacity, or water can be pumped from one well and exhausted to another well in the vicinity. The cost of digging or drilling wells differs with the type of subsoil or rock, and this factor alone might involve expense that would prohibit the use of the heat pump method in some places. In utilizing water for heat pump purposes, it would be important, however, to take measures against its being contaminated, since large-scale use of the heat pump in a fashion that would not give assurance against bacterial or metallic contamination of the water could do great harm to the water supply of the whole neighborhood or region.

For the urban or suburban dweller who has no access to ground water, lakes, or rivers, the best hope of enjoying the benefits of this new type of heating appears to lie in the possible development of a new form of public utility. Such a plant would circulate water through the community at ground temperature, about 50°F, and the consumer's own small heat pump would use the water as a source of heat, returning it to the system at a lowered temperature. The installation cost of such a system would be reasonable because there

would be no necessity for insulating the pipes as in the case of delivery of steam from a central plant. Cost of operation also would be far below that of a steam-distributing plant. The central station would use a convenient lake or other water supply as its source, and possibly could extend its business to include refrigeration, using the refrigerated space as a partial source of heat. A station of such moderate size as would be required to serve even a small real estate development should be able to achieve a coefficient of performance of about 6, in the opinion of some utility engineers who have studied the possibilities. Installation of such a system as this, however, does not appear to be practicable, at least for the present, in any large community.

Another practical application of the heat pump method which could in principle be utilized anywhere without the necessity for wells, or of awaiting the development of a community supply of heat source, is the provision of simultaneous hot-water supply and refrigeration. If the two loads are balanced properly, no outside source of heat is required, and since both loads are fairly uniform over the year, such balancing offers no great difficulty. It is understood that some manufacturers are working on the development of such units at this time, but there is, of course, no likelihood that the equipment, at practical prices and without risk of important servicing problems, will be available in the near future. An article in the February 16, 1946 issue of *Electrical World* states that a householder was able to make a heat pump powered with a $\frac{1}{4}$ horsepower motor, which maintains a temperature of 130°F in a 50-gallon tank while supplying the hot-water requirements of a family of six, and operates the family refrigerator simultaneously; cost of operation on the lower block of regular domestic rates is less than that of heating the same tank by the resistance method on an off-peak rate (which is likely

to be in the region of 1 cent per kilowatt-hour).

At the present stage of development, the initial cost of a heat pump installation which would provide heat for the house in winter and cooling for it in summer would exceed the cost of a conventional heating system alone, but should, after various developmental and production problems are solved, be little if any more than that of a complete heating and cooling system of the usual type. Addition of means for providing the hot-water supply and of caring for all household refrigeration requirements is entirely practicable and should cost little more than the cost of piping. Such an installation would cost materially less than the separate units which would be required otherwise to provide the same services, and would take up far less space.

Messrs. Philip Sporn and E. R. Ambrose of the American Gas and Electric Service Corporation in an article in the January 1944 issue of *Heating and Ventilating* give a comparison of the costs of heating by the heat pump and by various

fuels. To establish this comparison for a situation which includes so many variables, it was necessary first to assume a net coefficient of performance for the heat pump (4.5), and an efficiency (65%) for the combustion heating systems. Equivalent costs are then stated to be:

Heat pump with electricity at 1.5 cents per kilowatt-hour

Coal of 12,000 Btu. per pound at \$15.30 per ton

Coal of 14,000 Btu. per pound at \$17.85 per ton

Oil of 125,000 Btu. per gallon at \$0.078 per gallon

Gas of 550 Btu. per cu. ft. at \$0.351 per 1000 cu. ft.

Gas of 1000 Btu. per cu. ft. at \$0.636 per 1000 cu. ft.

The relative cost of electric heating by means of the heat pump and the cost of *electric heating by resistance units* is of course the reciprocal of the coefficient of performance, or $1/4.5 = 0.22$ for the value of the coefficient assumed in the above paragraph. Use of a heat pump, therefore, can provide a means of making all-electric heating economically practicable in regions where electricity costs

not more than about 2 cents per kilowatt-hour; the electrical utilities are well aware of that fact, and may be expected to develop the heat pump and to promote its use as a means of increasing their domestic loads. (What is "economically practicable," of course, depends on what fuels are available and "cheap" in terms of the practices and customs of a given locality. See reference to this point in connection with anthracite coal and oil on p. 25, col. 1.)

While the cost of operation of a heat pump, if the system were available, would at present be higher than that of burning anthracite coal, its advantages may more than offset the expense with many users. The dirt inherent in the use of any combustion heating device is eliminated completely, and no chimney is required for the house. In favorably situated localities, the use of the "solar house" design would reduce materially the expense of operating a heat pump. Installation of a heat pump to operate any existing heating plant would appear not to be practical or advisable.

High-Grade Pickup and Preamplifier Available

THE *General Electric Variable Reluctance* phonograph pickup (reported in CONSUMERS' RESEARCH BULLETIN of November 1946 and mentioned briefly on page 18 of the December 1946 BULLETIN) is making a considerable name for itself, and is being much used in broadcasting stations (for reproduction of shellac records) in competition with phonograph pickups costing 10 or 20 times as much. Its performance is really scintillating compared with most of the pickups or "tone arms" hitherto available to ultimate consumers, and it is the best possible, we believe, at anything near the price at which it is offered. (About

\$4.50 for the cartridge alone.)

The direct output from this pickup is too low to be effectively used by most amplifiers, radios, and phonographs, and in addition, when used uncompensated it is, like most other pickups, deficient to a considerable extent in both high and low frequencies.

A preamplifier-equalizer has been designed by Mr. Edward W. Brown, Jr., Deepwood Drive, Lexington, Kentucky, for use with this specific pickup. This unit functions to raise the output to a useful level such as will feed the ordinary power amplifier or the audio amplifier of a radio or radio-phonograph, and at the

same time to give the correct frequency response in the low and high frequencies. The preamplifier output is approximately 1 volt from a standard test record (about 1.5 volts maximum from regular musical records), and the frequency response uniform or "flat" (within 1.5 decibels) from 50 to 10,000 cycles per second for most commercial records (records having a constant velocity characteristic with turnover at 500 cycles per second). The preamplifier functions with one dual tube. Prospective purchasers should make certain that 1 volt will be enough. An additional model with one extra tube, priced \$4

higher, will be available to give a maximum of 4 volts when needed. This will have a gain control also. Connections are provided by which the tube filament and plate supply can be furnished from an existing amplifier or radio, but such connection can only be made by a qualified serviceman, or preferably a radio technician. (The output of the preamplifier made by GE is quite deficient in both highs and lows; its high frequency response can be increased considerably by removal of the 6800 ohm pickup load resistor.)

Where use of the existing power supply is not convenient or desirable, a built-in power supply of the transformer type can be included on the same chassis. This uses a 5Y3 tube. This arrangement will be the most practicable one for the person who does not himself have facility with radio equipment and does not know

of a serviceman who can make the changeover readily. (The difference in the price with and without the power supply is no more, perhaps, than in some cases would be charged by a radio serviceman making a connection to the existing power supply in the radio or radio-phonograph.) It is suggested that this new equipment is hardly worth purchasing unless the audio system through which it will be played is of a very good grade. In other words, it will not be desirable in most cases to buy the special pickup and preamplifier-equalizer arrangement unless the radio or radio-phonograph to which it is to be connected is of a really good and approximately high-fidelity type.

The price: *without the power supply, \$12; with the power supply, \$20.* These prices do not include pickup and arm, which are \$10 additional. Delivery will require about two

weeks—perhaps more, if a considerable number of orders are received. Address orders to: Mr. Edward W. Brown, Jr., Deepwood Drive, Lexington, Kentucky.

Very recently Pickering & Co., Inc., 29 W. 57 St., New York 19, have brought out a pickup cartridge, *Model 120M*, which sells at a figure very much below the price of their *Model 161M* at \$84, without preamplifier, reported as the best pickup so far tested (in CR's April 1947 BULLETIN); the new unit is priced at \$15, without arm. CR will report on the new *Pickering* cartridge in the near future, and will consider making arrangements for providing a preamplifier for it also, probably one that can be made to work either with the GE or the *Pickering*, by making a simple circuit change, in case the purchaser of the one pickup wishes for some reason to change to the other.

Off the Editor's Chest

[Continued from page 2]

situation is reported to be even worse than during wartime. The weekly rations for Britons in September 1947 included: a shilling's worth of meat, 8 ounces of sugar, 7 ounces of fat, 2 ounces of bacon. Shell eggs have been rationed, at one a week. Kipperd herring and fresh fruit and vegetables have been among the unrationed items, but when they are available it is necessary to queue up in order to obtain them. Cigarets cost 68 cents a pack. A man's shirt of good quality sells for around \$6. A man is allowed coupons to buy one suit a year, but if he buys the suit, his coupons for clothing will all be used up with that one purchase.

Other facts about comparative living standards that come to hand indicate that the average Ameri-

can factory worker can buy a pair of work shoes with the wages earned in three and one-half hours' work, whereas it takes an English worker nine hours to earn a pair of shoes. In Russia, a worker would be able to buy (if he could get it) less than 10 pounds of meat *with a full week's pay*, as against 82 pounds of beef which an American worker could buy for his week's wages, and still have some money left. It would take the Russian worker's full week's wages to buy 4 pounds of butter, while the American worker could buy at least 70 pounds and still have money left.

These random comparisons taken from travelers' observations and expert studies of wages and living standards all indicate that we have it pretty good over here,

in terms of other nations' problems. During the past decade or two it has been the intellectual fashion to make moan over the sad state of this nation, somewhat in the manner of a well-fed drunk crying into his beer. Isn't it about time we stopped feeling sorry for ourselves and giving heed and support to noisy pressure groups which from time to time make the headlines with their wails that conditions are just too terrible and that Congress, or the President, or just the Mayor, *simply must do something?* The "doing something" always turns out to be a new scheme for taking money out of one pocket and putting it into another by raising wages, or taxes, or decreeing a subsidy—it never means anything so practical as increasing output,

or indulging in fewer strikes, or rendering distribution more efficient, so that there will be more and better goods to buy.

In countries such as Britain and Russia where the respective governments are "doing something," in a big way, consumers are faring very badly, and the more the governments have taken over problems of production and distribution, the worse the consumer's situation has become. There are a lot of well-informed people who believe that the reason we are doing so well that practically every country in the world thinks we should help it out of its difficulties is that, except for a few years of unhappy experimentation with NRA, and OPA's rationing and price control during the war, we

haven't had any extensive operation of general government price-fixing and detailed control of production and distribution. In fact, the high prices of certain foods at the present time are laid at the door of those governmental attempts that have been tried, such as the U. S. Department of Agriculture's setting support prices for certain farm commodities and buying up "surplus" production for "diversion," or destruction. U. S. consumers will be wise to demand that the next Congress abolish all authority for such policies. Government officials are always talking of the need for lower prices; they never explain that it was they and their price support and wage support policies, their restrictions on production, and their constant

spending beyond income, even in peacetime, that are important factors in making high prices inevitable.

Consumers in this country can be thankful for a good many things, but it is to be hoped that they observe well the plight of consumers in other lands, and then proceed to encourage the distinctively American techniques for *increasing the supply of the products they want more of, and decreasing governmental expenditures*, thereby reducing the prices of nearly everything they buy. No Minister or Commissar of Supply in Washington can do the job so effectively; if prices could be *talked* down, the bureaucrats would long since have restored us to normalcy.

One More Automatic Coffee Maker

THE *Cory Automatic* coffee maker was not available when samples were purchased for the test reported in the September BULLETIN, but a sample was finally obtained, after the delay usual in attempting to purchase particular appliances in recent months. The *Cory* has now been tested using the same procedures as were used with the previous group.

The *Automatic* was a very good looking coffee maker, much like the *Cory Rubberless* reported in the previous BULLETIN article, but with a polished metal pitcher-type base. A *Calrod*-type high-wattage heating element was attached directly to the bottom of the metal bowl, an arrangement that makes for efficient heat transfer from heater to bowl. A rubber gasket was



used in this model; the assembly was more stable than that of the *Cory Rubberless*.

Like most of the other coffee makers reported on in our recent study, this one was found

satisfactory in leakage current and proof-voltage tests. Its brewing time was the shortest of all those reported on. Altogether it was judged a very good coffee maker.

A. Recommended

Cory Domestic Automatic, Model DEA (Cory Corp., Chicago 1) \$25.50. Capacity, 6 to 8 cups. Vacuum-type with glass top and chromium-plated metal base with pouring lip, using rubber gasket for sealing; well designed and of acceptable appearance. Self-contained electric heating unit; fully automatic. Rated (and actual) wattage, 800 watts. Brewing time shortest of coffee makers tested; during brewing, contents of upper bowl are violently agitated by steam from lower bowl, making cover necessary. Used *Cory* glass rod as filter. Quality of coffee was slightly below average; fairly strong but somewhat turbid, and contained considerable sediment. Easy to clean.

Results of Further Tests on Electric Blankets

A PRELIMINARY report on three electrically-heated blankets and the *Westinghouse Comforter*, which appeared in the February 1947 BULLETIN, gave the results of temperature and leakage measurements and discussed the effectiveness of the controls intended to maintain a constant safe temperature. In that preliminary report it was stated that "risk of electrocution or of being burned through their [electric blankets,] use may be only slight." Since that time CR has received reports of two fires; in each instance the origin of the fire was directly traced to an electric blanket. It is too easy to assume that something as quiet and harmless-looking as an electric blanket will be free from elements of danger under any and all circumstances, but prospective purchasers and users are again warned that there is real need for care in the use of an appliance of this type, especially where young children or invalids are concerned.

A second series of tests on electric blankets included a folding test, an endurance test, and additional leakage measurements.

In the endurance test, the *Simmons* and the *General Electric* blankets and the *Westinghouse Comforter* were spread over three test beds in the usual manner. These beds were placed in a room in which the temperature was constantly varying. Two electric fans were so placed as to keep the air in continuous circulation in the room. Twelve thermocouples were used to measure

temperature, three being placed under each blanket in relatively similar positions and three placed at different positions in the room to measure room temperature. During this test, no attempt was made to hold a controlled room temperature, as was done in the previous tests, for the purpose of the later series of tests was to find out whether the blanket controls responded to slight continuous variations in room temperature and tended to maintain under-the-blanket temperature at that temperature at which the controls were set.

Readings, which were automatically taken at approximately 11-minute intervals for a 100-hour period, showed that the blanket controls did not respond in a definite, dependable

manner. Indeed, a glance at the graph shown in Figure 1, which includes only a small part of the continuous 100-hour record, will show that there was only a slight degree of regulation, and certainly little control during short variations in room temperature, for in several instances blanket temperatures increased with a drop in room temperature and *vice versa*.

It is of particular interest, likewise, that under the foregoing conditions the blankets all showed wide variations in under-the-blanket temperature. The average room temperature for the 100-hour test varied between 52° and 69°. The temperature under the *Westinghouse Comforter* varied from 84° to 95°; under the

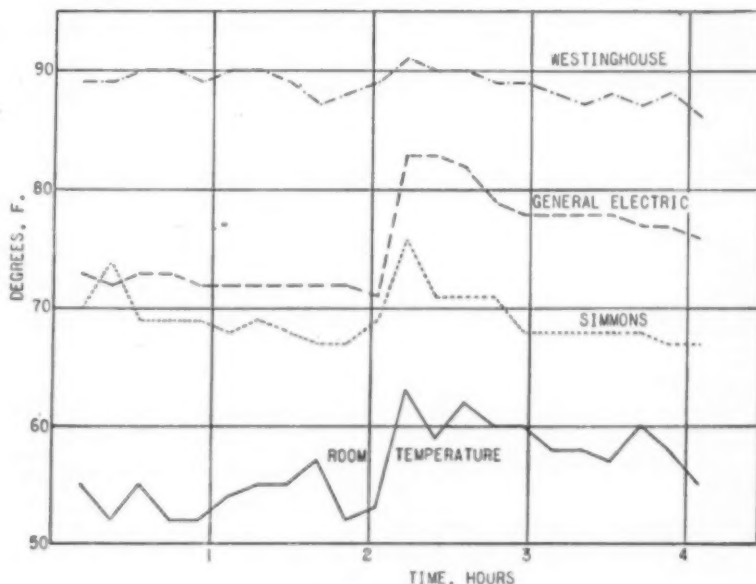


Figure 1

Graph showing a part of the full record of temperature variations under three makes of blankets with varying room temperature. Note better temperature regulation of Westinghouse Comforter (which was listed as Not Recommended principally because of an exceedingly high leakage current). (The lines represent only one twenty-fifth of the record of the 100-hour run.)

General Electric from 71° to 85°; and under the *Simmons* from 66° to 80°. (The *Woolec-tra* was not tested in this series of measurements.)

Folding Test

A section of each blanket was subjected to a folding test to determine, as nearly as possible, the effect of wear on the electrical characteristics of the blankets. The fold, made cross-wise to the heater wires, was repeated 31,000 times for each blanket at a rate of 20 folds a minute. Electrical continuity measurements were made before, during, and after this folding test. None of the blankets were found defective

as a result of the folding action. In order to discover if there was a possibility of damage to or weakening of the heating wires themselves at the fold, two radiographs were taken of the *Simmons* blanket showing the complete area of the 18-inch fold. This picture did not show any weakening or fraying of the heater or control wires.

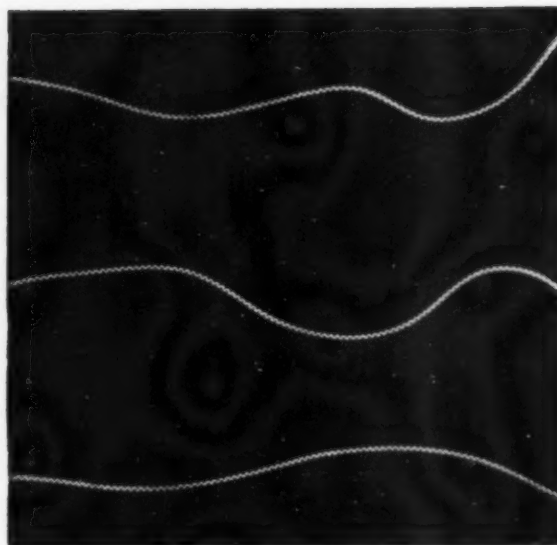


Figure 2

X-ray photograph (negative) of part of folded section of Simmons blanket.

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Water-softening equipment†	July, 10-15
Weed killer, 2,4-D	July, 17
Wool, high prices	Oct., 37
Wrench, jar	Oct., 8

†Indicates that listings of names or brands are included.

Door Chimes

CONSUMERS' RESEARCH has recently completed a series of tests of a mechanically operated and nine electrically operated door chimes, which are pleasant-toned appliances, now widely sold to replace the old-fashioned loud-ringing bell or buzzer. The tests included comparative operation on dry cells as a source of current and on the usual step-down transformers. Tests were also made with an adjustable source voltage. The sound levels, or loudness, produced by the chimes were measured and an appraisal made of the tone and carrying quality of the chimes. The possibility of dampness having an unfavorable effect on the chime mechanism was also studied by operation in a humid atmosphere. Finally, life tests were made to determine durability and disclose any mechanical weaknesses that might not have been evident during the engineering examination. It was found, in general, that dry cells gave better operation than transformers. Moreover, the transformers used with door chimes consume a great deal more energizing current than the transformers that perform a similar function with the ordinary electric bell, and thus their operation may require about 10 cents worth of electricity per month as compared with something less than 1½ cents worth, on the average, for the ordinary bell transformer. The chime transformer needs to have proper power output. It cannot be selected

on a voltage output basis alone, as is commonly done with small transformers for operating bells.

Installation of a chime transformer requires considerably more care than that for a bell transformer, as their design is such that short circuiting of the secondary will cause a quick burn-out. (Bell transformers can stand short circuiting without failure.) Though some chime transformers have an automatic overload cut-out, one of this type failed to act in an overload test.

A chime will normally require considerably more power to operate to give the same carrying quality of sound as an electric doorbell, and for this reason if a chime is installed to operate on an existing bell transformer, the level of sound produced may be too low. It will certainly be much less than that of the bell which it replaces.

Chimes have another disadvantage, namely, that they are more readily affected by accumulations of dust and grease than bells, and on this account, it is important to choose a chime which has its mechanism well protected from foreign material.

Tests of the tone and carrying quality of the chimes indicated that individual tastes would enter into most cases to determine the selection of a chime. In this connection, the size of the dwelling or apartment would also be a factor, and its particular location and appearance.

All the electrically operated

chimes given in the following listings were of the type which sounded two tones for the front door and one for the rear. The dry cell or transformer for their operation was not included in the selling price. The transformers cost about \$1 to \$2 extra (average price perhaps about \$1.50). Transformers used in the test were: (1) *Edwards*, Cat. No. 1872, with 6, 12, or 18 volts output; (2) *Edwards*, Cat. No. 86, 10 volts output; (3) *Snapit*, Cat. No. 2332, 16 volts output; (4) *Nutone*, Cat. No. B-10-A, 10 volts output; and (5) *Killark*, Cat. No. 6166, 8 volts output.

Electrically Operated Chimes

A. Recommended

Liberty Electric Door Chime, Model No. 3E (Liberty Bell Mfg. Co., Minerva, Ohio) \$2.95. 4½ in. high, 7 in. wide, 2 in. deep. Metal case, ivory and gold finish. Required 3 No. 6 dry cells (the regular doorbell batteries), or any transformer listed in the text, in preceding paragraph, for satisfactory operation. Tone quality judged fair, carrying quality of tone considered fair. Tone bars became slightly rusty in humid atmosphere. No failure developed in durability test. 1

The Colonial III, Model No. 1621 (Edwards & Co., Inc., Norwalk, Conn.) \$8.95. Metal case, ivory finish. Over-all size 43½ in. high, 8¼ in. wide, 2¼ in. deep. Although this chime had 3 hanging brass tubes, the center one was false and for "decorative" purposes only. Required 4 dry cells, or transformers 3 or 4, for satisfactory operation. Tone quality judged fair to good, carrying quality of tone considered good. No failure developed in durability test. Provision was made for

hanging the tone tubes at different distances from the striker to obtain best results. Tube vibrations when a heavy duty transformer was used caused the cover to fall off. 3

B. Intermediate

Continental, Model K-32 (Nutone Inc., Cincinnati) \$9.95. Ivory colored plastic cover. Tubes, burnished brass. 42 in. x 7 $\frac{3}{4}$ in. x 3 in. Although this chime had 3 brass tubes, the center tube was not operative. This appliance gave satisfactory operation on 4 dry cells, or transformers 1, 3, or 4. Tone quality judged good, carrying quality considered good by all judges. No failure developed in durability test. No provision was made for hanging the tone tubes at different distances from the striker. Because the original mechanism did not function correctly, a new one was obtained. With the second mechanism, the first note was so loud and resonant while the second was relatively soft, that at times it was not possible to distinguish between the one note (rear) and the two note (front) chime. The manufacturer provided felt to soften the note and recommended as an alternative that a piece of tape be applied to the tone arm at the point where the plunger strikes. 3

C. Not Recommended

The Captain, Model No. 1605 (Edwards & Co., Inc.) \$2.80. Metal case, ivory finish. 6 $\frac{1}{2}$ in. x 3 in. x 2 $\frac{1}{4}$ in. Operated satisfactorily on 3 dry cells, or any one of the first 4 of the test transformers. Tone quality judged fair, carrying quality considered poor. Appearance not affected when exposed to humid atmosphere. Rear door tone failed to operate after 10,000 operations. Mechanism appeared to be identical to *The Major*, except that it did not have long resonating tubes. A spring adjustment had to be made to move the striker away from the tone bar. 1

Electric Door Chime, Model 220 (A. E. Rittenhouse Co., Inc., Honeoye Falls, N.Y.) \$2.95. 4 in. x 7 in. x 2 in. Metal case, white enamel finish. Gave good operation with 3 dry cells, and would work on any transformer listed. Tone quality judged fair to good, carrying quality judged poor to good. Rear door tone was found not to be working after 50,000 operations. The mechanism of this chime appeared to be well constructed, but there was a bad vibrating quality when used on house current rather than on batteries. 1

The Melody, Model 411 (Mell-O-Chime & Signal Corp., 564 W. Adams St., Chicago 6) \$3.20. Molded plastic case, ivory finished. 7 in. x 4 in. x 2 $\frac{1}{4}$ in. Operated satisfactorily from 3 dry cells, or any transformer listed. Tone quality judged poor to fair, carrying quality considered poor to good. Solenoid cores became tarnished in humid atmosphere. Front door tones were found not to be working after 50,000 operations. 1

"Snapit" Door and Signal Chime, De-Luxe Model (Marks Products Co., Inc., Brooklyn, N.Y.) \$2.40. 7 in. x 3 $\frac{3}{4}$ in. x 2 $\frac{1}{4}$ in. Ivory plastic molded case. Gave satisfactory operation with 4 dry cells, or transformer 4. Tone quality considered fair to good, carrying quality judged poor to fair. Operation was sluggish in life test and rear tone failed to operate after 30,000 operations. This chime was constructed differently from the others in that its mechanism was in the cover and could not easily be removed. This would make it difficult to clean. 1

Edwards, The Major, Model 1606 (Edwards & Co., Inc.) \$4.95. For use with *Edwards* No. 86 or No. 878 transformers. Brass shield with 2 white enamel finished resonators. 7 $\frac{1}{2}$ in. x 6 in. x 2 $\frac{1}{4}$ in. Satisfactory operation with 3 dry cells, or any transformer listed. Tone quality considered poor, carrying quality

considered fair to good. Solenoid cores became rusty in humid atmosphere. Operated 50,000 times satisfactorily. This chime had an undesirable ringing noise when used on a 60 cycle house circuit, due to the striker's vibrating against the tone bar. This was eliminated by a slight readjustment of the sound bar, but the maker furnished no instructions for such adjustment. 2

Nutone, The Kitchener, Style J-16 (Nutone Inc.) \$4.95. Used *Nutone B-10-A* transformer. White enamel metal case with chrome trim. 12 $\frac{1}{2}$ in. x 8 in. x 3 in. Satisfactory operation using 4 dry cells, or *Nutone* transformer (No. 4 in text) only. In starting position, tone quality considered good by all judges, carrying quality poor to good. Tone bars became rusty in humid atmosphere. In the life test, the rear door tone ceased to operate after 20,000 operations. Mechanism did not have the finished appearance of some of the other chimes, but information obtained indicated that this was an older model and has since been improved upon. 2

Mechanically Operated Chime

B. Intermediate

Suburban Model, Hand Operated Door Chime (Auth Electric Co., Inc., 34-20 45 St., Long Island City 1, N.Y.) \$5.50. Chime case of metal finished in ivory enamel. 6 $\frac{1}{2}$ in. x 3 in. x 1 $\frac{3}{4}$ in. This chime was operated by a brass door knocker supplied and located outside the entrance. This chime, of necessity, would have to be mounted at one of the entrances to a home. Tone quality and carrying quality considered poor to fair. Gave 50,000 satisfactory operations in an endurance test. Its low tone carrying quality would limit its use to small apartments. Generally well constructed. 2

Don't Skimp on Protein Foods

Dear Consumers' Research:

In many popular articles in the press and certain magazines, the problem of the higher costs of food is solved by recipes and menus in which the urge

or necessity for saving money is met by combinations which reduce the food value of the meal or change it from a predominantly protein meal to one too high in total carbo-

hydrates. Protein is the food substance which particularly characterizes foods which derive from the animal kingdom, e.g., meat, eggs, and fish. For instance, I found at a luncheon

yesterday that the main dish was escalloped macaroni with chicken, nicely done, well flavored, but for anyone restricted on carbohydrates worse than no luncheon at all. I had about two 2-inch sliced squares of white meat. Whole wheat muffins, pickles, cookies and coffee accompanied this.

For teen age young people it is better to serve a half-size portion of beef (or other meat), if one can afford only that much, than a quarter-size bit of beef plus a dumpling and some water. Some such rec-

ipes are practically adulterating. There needs to be plenty of warning against too many added ingredients, which, taken together and allowing for the cost of the extra labor and non-protein materials involved, would cost almost as much as the larger ration of protein food. Vitamins must be present in sufficient amount, of course, but they should accompany a minimum base of protein foodstuffs. I *should* have been able to take from my serving several ample pieces of chicken, leaving the starchy

combination entirely, with a leaf of lettuce, shredded cabbage, etc. Restaurants cheapen food this way, but homes should not do so.

* * *

Miss Mary B. Smith, who wrote the foregoing brief note, was trained at Smith and Simmons Colleges and did post-graduate work at Simmons. Her work has given her much opportunity to judge the effect of faulty food selection on health.

Test a Lens *Before* You Buy It

LETTERS from subscribers indicate that many consumers still believe that a well-known trade name or manufacturer's name engraved on the mount of a photographic lens is assurance of good quality. At one time that may have been true, but it is not true at present of lenses of American manufacture, except the uniformly excellent lenses made by the C. P. Goerz American Optical Company.

The condition abroad is perhaps the same. Up to about 1930 a Carl Zeiss *Tessar* or *Protar* could be purchased with reasonable assurance that it would perform satisfactorily. At about that time the firm began producing lenses of wider aperture (fast lenses), and therefore necessarily of lower resolving power (because of the impossibility of correcting the wide aperture lenses to the same degree as was possible with the slower lenses). Lenses of cheaper construction, and carrying the same maker's name, were also added to the line for use on lower-priced cameras. Whether

public acceptance of those lenses led the maker to believe that lowered quality in the old standard lines would pass unnoticed, or whether it was coincidence, it is a fact that the high degree of uniformity once possessed by *Tessars* and *Protars* suffered a decline. Many individual lenses were of the same high quality as earlier lenses, but it was no longer possible to buy a *Tessar* or *Protar* with full confidence that the particular lens purchased would prove to be of top quality, as good as some other lenses of the same make which had been bought previously. Of course, the laws of chance would indicate that among the flood of inferior lenses recently coming to the market, an occasional one might be good. The current practice of naming lenses by "lines" instead of by the classical system of naming their type has been a source of confusion to consumers. For example, a *Dagor* is always a symmetrical lens, each half of which is composed of three glasses cemented to each other. A *Tessar* is an un-

symmetrical lens which includes two uncemented glasses of which one is converging and the other diverging, and two cemented glasses of which one is converging and the other diverging; the order of glasses from front to rear of the lens is not always the same, but the quality of performance is similar. The *Dagor* and *Tessar* are of such definite characteristics that lenses of the same constructions are often known as *Dagor*-type or *Tessar*-type lenses respectively. The case is quite different, however, with the Eastman Kodak Company's *Ektar* lenses; *Ektar* is not the name of a type (as it ought to be from the consumers' standpoint), but is simply a trade name given to a line of lenses in the highest price range of which the individual examples are of widely differing constructions. Some *Ektars* are *Tessar*-type lenses; others are of 5-glass construction somewhat like that of the Dallmeyer *Pentac*, the Voigtlander *Dynar*, and some forms of the Voigtlander *Heliar*. Theoretically

cally a lens of this type is susceptible of finer correction than is one of the *Tessar*-type, because there are five glasses instead of four. The fastest *Ektars* resemble other fast lenses, such as the Zeiss *Biotar* and the Taylor-Hobson *Opic*; they have six and seven glasses as required to give satisfactory correction when used at wide aperture. Another *Ektar* is of the Cooke triplet type. The Wollensak Optical Company's *Velostigmats* are another example of lenses named by price line instead of by type.

For complete evaluation of the aberrations with which a lens may be afflicted, a test on the optical bench is required, but a simple practical test anyone can make will give useful information to the prospective purchaser. This test consists in photographing a test object which contains fine detail. The best test object readily available is the set of charts supplied by the National Bureau of Standards; several charts are included with Circular C428, "A Test of Lens Resolution for the Photographer," 40 cents, from the Government Printing Office. The booklet gives full directions for use of the charts. If quantitative results are not required, printed matter such as pages from magazines printed on a fairly good grade of paper may be fastened to a wall and photographed. One page should be in the center of the area to be included in the photograph and others should be at the margins of the area. It is *absolutely essential* that the focal plane of the lens be closely adjusted so as to be accurately parallel to the plane of the material to be photographed. The distance chosen to set the camera when pages containing average magazine type are used

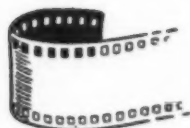
may be a distance between 20 and 25 times the focal length of the lens under test. While it is unlikely that any lens which passes this test will be found to perform poorly when focused at infinity, nevertheless it is a good idea to check by making an exposure on some distant patterned, stationary object; brick buildings are particularly good for the purpose. A fine-grain panchromatic film or plate should be used, because some lenses which give satisfactory definition on "colorblind" or even orthochromatic emulsions do not have enough color correction to perform as well on panchromatic material.

When the negative has been developed, it should be examined under a magnifier of from 5- to 10-power; better still, an enlargement of about 5 or 7 times may be made on glossy paper; the enlarger should, of course, be focused with the utmost care. If the picture is unsharp all over (assuming that the focusing was very carefully done), either the focal plane of the lens does not coincide with the plane of the sensitive film, which is a fault of the camera and not of the lens; or the lens is faulty, simply incapable of good definition. A fairly good lens will usually have zones in which definition is good—usually in the center—whereas at the edges, the definition will be of a lower grade. Such a lens may be acceptable for some purposes, or it may be as good as the market affords at its price. For the best work, it will not be satisfactory.

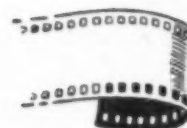
In buying a complete camera, it is necessary not only to test the lens, but to check the accuracy of the focusing scale, for sometimes the focusing scale

does not suit the camera at all, having been intended for a lens of a focal length other than that of the lens with which the camera is equipped; manufacturers unfortunately often do not take the pains with problems of focusing scale accuracy which they should. Similarly a used camera may have been fitted with a wrong focusing scale by an incompetent repairman. The focusing scale may be graduated in correct proportion for the lens with which it is to be used, but may be placed at a wrong distance from the lens; then the film plane and focal plane do not coincide, and pictures are out of focus. For fine work it will often pay the user to check his focusing scale at several points. The check is made by making an exposure at each distance marked on the scale, measuring carefully with a tape the distance from the lens to the object being photographed. Each negative is then checked for sharp definition. If the subject is chosen to have several sharply defined objects located at distances of several feet on each side of the correct focal distance, it will be possible to determine just about how large is the error of the scale at each point. For instance, it may be found that objects at exactly 10 feet are out of focus and objects at 11½ feet are in sharp focus when the setting is for 10 feet. This permits the user to make corrections in using his camera, or to re-mark the focusing scale to suit his findings.

Photographic equipment is much less uniform than in the pre-war period. One will be well advised, therefore, not to purchase any camera, new or used, except on the basis of return of full purchase price if it fails to pass the tests suggested.



Ratings of Motion Pictures



THIS section aims to give critical consumers a digest of opinion from a wide range of motion picture reviews, including the motion picture trade press, leading newspapers and magazines—some 19 different periodicals in all. The motion picture ratings which follow thus do not represent the judgment of a single person, but are based on an analysis of critics' reviews.

The sources of the reviews are:

Box Office, *Charm*, *Chicago Daily Tribune*, *The Christian Century*, *Cue*, *Daily News* (N.Y.), *The Exhibitor*, *Harrison's Reports*, *Motion Picture Herald*, *National Legion of Decency List*, *Newsweek*, *New York Herald Tribune*, *New York Times*, *Parents' Magazine*, *Release of the D.A.R. Preview Committee*, *Successful Farming*, *Time*, *Variety* (weekly), and *Unbiased Opinions of Current Motion Pictures* which includes reviews by the General Federation of Women's Clubs, the American Legion Auxiliary, National Film Music Council, and others.

The figures preceding the title of the picture indicate the number of critics who have been judged to rate the film A (recommended), B (intermediate), and C (not recommended) on its entertainment values.

Audience suitability is indicated by "A" for adults, "Y" for young people (14-18), and "C" for children, at the end of each line.

Descriptive abbreviations are as follows:

adv—adventure
biog—biography
c—in color (Technicolor, Cinecolor, Trucolor, Magnacolor, or Vitacolor)
car—cartoon
com—comedy
cri—crime and capture of criminals
doc—documentary
dr—drama
fan—fantasy

hist—founded on historical incident
mel—melodrama
mus—musical
mys—mystery
nov—dramatization of a novel
rom—romance
soc—social-problem drama
trav—travelogue
war—dealing with the lives of people in wartime
wes—western

A	B	C		
—	2	5	Adventure Island.....	adv-c A
—	3	2	Adventures of Don Coyote.....	mus-wes-c AYC
2	11	—	Adventuress, The.....	war-mel A
—	2	2	Along the Oregon Trail.....	mus-wes-c AYC
—	5	2	Angel and Sinner.....	dr A
—	3	1	Angels of the Streets.....	soc-dr AY
—	2	4	Anything for a Song.....	mus-dr A
—	6	3	Apache Rose.....	mus-wes-c AYC
—	—	3	Arnelo Affair, The.....	cri-mel A
1	14	1	Bachelor and the Bobby- Soxer, The.....	com AY
—	1	8	Backlash.....	mys-mel A
—	3	6	Banjo.....	dr AYC
1	4	3	Barber of Seville, The.....	mus-dr AY
—	2	6	Beat the Band.....	mus-com A
1	3	4	Bellman, The.....	mel A
—	6	1	Bells of San Angelo.....	mus-wes-c AYC
—	1	6	Bells of San Fernando.....	mel A
—	3	2	Big Fix, The.....	mel AY
—	2	4	Big Town.....	dr A
2	6	2	Black Gold.....	dr-c AYC
—	5	8	Black Narcissus.....	dr-c A
—	1	7	Blackmail.....	mys-mel A
—	3	4	Blondie's Holiday.....	com AYC
2	5	1	Bob, Son of Battle.....	dr-c AY
1	5	2	Body and Soul.....	dr A
—	2	2	Border Feud.....	wes AY
—	4	11	Born to Kill.....	cri-mel A
—	6	8	Brute Force.....	cri-mel A
—	8	2	Buck Privates Come Home.....	com AYC
—	4	—	Buffalo Bill Rides Again.....	wes AYC
—	1	4	Bulldog Drummond at Bay.....	mys-mel AYC
—	4	4	Burning Cross, The.....	dr A
1	8	1	Cage of Nightingales, A.....	dr A
—	5	11	Calcutta.....	cri-mel A
2	8	4	Captive Heart, The.....	war-dr AY
—	1	4	Caravan.....	adv A
—	9	5	Carnegie Hall.....	mus-dr A
—	8	4	Carnival in Costa Rica.....	mus-com-c AY
—	3	4	Carnival of Sinners.....	dr A
—	—	3	Case of the Baby Sitter.....	com A
—	10	5	Cheyenne.....	mus-wes A
—	2	2	Christmas Eve.....	dr A
—	1	2	Citizen Saint.....	doc-dr AYC
—	—	3	Code of the Saddle.....	wes AYC
—	2	2	Colonel Chabert.....	dr A
—	2	2	Comedy Carnival.....	com-c A
1	10	3	Copacabana.....	mus-com A
—	3	8	Corpse Came C.O.D., The.....	cri-com A
—	4	2	Crimson Key, The.....	mys-mel A
2	13	4	Crossfire.....	soc-mel A
—	3	9	Cry Wolf.....	mys-mel A
1	9	2	Cynthia.....	com AYC
—	1	7	Danger Street.....	cri-mel A
—	3	3	Dangerous Venture.....	wes AYC
—	4	7	Dark Delusion.....	dr AY
—	5	4	Dark Passage.....	nov A
1	13	3	Dear Ruth.....	com AY
—	8	7	Deep Valley.....	mel A
—	3	8	Desert Fury.....	mel-c A
—	3	3	Desperate.....	cri-mel AY
—	7	3	Devil Thumbs a Ride, The.....	mel A
—	2	5	Devil's Envoys, The.....	fan A
—	3	8	Dick Tracy's Dilemma.....	cri-mel A
—	8	8	Dishonored Lady.....	dr A
2	9	6	Down to Earth.....	mus-fan A
—	4	1	Dragnet.....	cri-mel AY
—	13	4	Egg and I, The.....	com A
—	1	2	Escape Me Never.....	dr A
—	1	4	Exposed.....	cri-mys AY
—	7	6	Fabulous Dorseys, The.....	mus-biog AYC
—	2	6	Fall Guy.....	mys-mel AY
—	8	4	Fear in the Night.....	cri-mel AY
3	8	4	Fiesta.....	mus-dr-c AY
—	—	3	Flashing Guns.....	wes AYC
—	3	4	For the Love of Rusty.....	dr AYC
—	1	2	Foxes of Harrow, The.....	adv A
—	7	7	Framed.....	mel A
—	9	3	Frieda.....	war-dr A
—	6	2	Fun and Fancy Free.....	mus-car-c AYC
—	3	4	Fun on a Weekend.....	com A
—	6	—	Gas House Kids Go West.....	com AY
—	4	—	Gas House Kids in Hollywood.....	mys-mel AYC
2	14	3	Ghost and Mrs. Muir, The.....	fan A
—	1	4	Ghost Goes Wild, The.....	com A
—	4	—	Ghost Town Renegades.....	wes AYC
—	5	3	Golden Earrings.....	war-mel A
—	1	2	Great Betrayal, The.....	doc A
—	4	1	Great Dawn, The.....	mus-dr A
11	7	1	Great Expectations.....	nov AYC
—	5	—	Green Cockatoo, The.....	cri-mel A
—	12	2	Green for Danger.....	mys-mel A
1	9	6	Guilt of Janet Ames, The.....	dr A
—	6	2	Guilty, The.....	mys-mel A
1	7	5	Gunfighters.....	wes-c A
—	—	—	Hal Roach Comedy Carnival (See Comedy Carnival)	
—	4	—	Hard Boiled Mahoney.....	mel A
—	1	3	Hat Box Mystery, The.....	mys-mel A
—	3	3	Heartaches.....	mus-mel AYC
—	4	4	Heaven Only Knows.....	fan A
—	7	1	Her Husband's Affairs.....	com AY
—	13	5	High Barbaree.....	dr AYC
—	8	1	High Conquest.....	adv A
1	4	—	High Tide.....	cri-mel A

A	B	C	
—	9	3	Hit Parade of 1947.....mus-com AY
—	2	2	Hollywood Barn Dance.....mus-com AY
—	4	—	Homesteaders of Paradise Valley...wes AYC
—	7	10	Homestretch, The.....dr-c A
—	5	10	Honeymoon.....mus-com A
—	—	4	Hoppy's Holiday.....wes AYC
2	11	3	Hucksters, The.....nov A
—	4	3	I Cover Big Town.....cri-mel A
2	12	3	I Know Where I'm Going.....dr A
1	9	4	I Wonder Who's Kissing Her Now.....mus-com-c A
—	4	9	Imperfect Lady, The.....dr A
2	13	—	It Happened in Brooklyn.....mus-com AYC
—	4	8	Ivan the Terrible.....hist-dr A
—	7	7	Ivy.....mys-mel A
—	1	8	Jewels of Brandenburg.....cri-mel AY
—	4	—	Joe Palooka in the Knockout...mys-mel AY
—	1	7	Jungle Flight.....dr A
—	3	5	Keeper of the Bees.....rom AYC
—	2	6	Key Witness.....cri-mel A
—	1	3	Killer at Large.....cri-mel A
—	4	1	Killer Dill.....cri-mel A
—	4	2	Kilroy Was Here.....com AY
—	2	4	King of the Wild Horses.....mus-mel AYC
2	3	2	King's Jester, The.....mel A
2	11	1	Kiss of Death.....mys-mel A
—	6	3	Lady Surrenders, A.....rom A
—	—	4	Land of the Lawless.....wes A
—	3	2	Last Frontier Uprising.....mus-wes-c AYC
—	1	7	Last of the Red Men.....nov-c AYC
—	—	4	L'Atalante.....dr A
—	—	6	Law Comes to Gunsight.....wes AYC
—	—	6	Law of the Lash.....wes AYC
—	1	2	Life Begins Anew.....dr A
3	13	1	Life With Father.....com-c AYC
—	3	6	Likely Story, A.....com A
—	2	4	Little Miss Broadway.....com A
—	5	7	Living in a Big Way.....mus-dr A
—	1	3	Lone Hand Texan, The.....mus-wes AYC
1	7	3	Long Night, The.....dr A
—	5	5	Lost Honeymoon.....com AY
—	3	1	Louisiana.....mus-biog AY
—	3	8	Love and Learn.....mus-com A
—	8	5	Love Laughs at Andy Hardy...mus-com AY
1	10	4	Lured.....cri-mel A
—	5	—	Magic Town.....dr A
—	2	3	Marauders, The.....wes AYC
—	2	2	Marshall of Cripple Creek.....wes AYC
—	5	3	Merton of the Movies.....com A
—	—	4	Millerson Case, The.....cri-mel A
5	12	1	Miracle on 34th Street.....com AYC
1	4	7	Monsieur Verdoux.....dr A
—	9	6	Moss Rose.....mys-mel A
—	7	4	Mother Wore Tights.....mus-com-c AY
—	4	3	Murderer Lives at Number 21, The.....mys-mel A
—	6	6	New Orleans.....mus-dr A
—	4	3	Newshounds.....cri-com AY
—	1	2	Nicholas Nickleby.....nov AY
—	7	5	Northwest Outpost.....mus-rom A
4	10	4	Odd Man Out.....dr A
—	—	4	Oregon Trail Scouts.....wes AYC
1	9	9	Other Love, The.....mus-dr A
—	5	2	Out of the Blue.....com A
—	—	4	Over the Sante Fe Trail.....mus-wes AYC
—	4	—	Pacific Adventure.....dr AYC
—	2	5	Patient Vanishes, The.....cri-mel A
2	12	1	Perils of Pauline.....mus-com-c AY
—	2	5	Philo Vance Returns.....mys-mel A
—	—	6	Philo Vance's Gamble.....mys-mel A
—	4	1	Philo Vance's Secret Mission...cri-mel AY
—	1	4	Pioneer Justice.....wes AYC
1	7	8	Possessed.....dr A
—	1	6	Pretender, The.....cri-mel AY
—	5	13	Private Affairs of Bel Ami, The...dr A
—	—	4	Queen of the Amazons.....mel A
—	2	2	Queen's Necklace, The.....hist-dr A
—	1	2	Rainbow over the Rockies.....mus-wes AYC
1	6	6	Ramrod.....wes A
—	4	1	Range Beyond the Blue.....mus-wes AYC
—	4	2	Red Stallion, The.....dr-c AYC

A	B	C	
—	8	8	Repeat Performance.....fan A
—	3	—	Ride the Pink Horse!.....cri-mel A
—	6	5	Riff-Raff.....mel A
—	3	—	Road Home, The.....war-dr A
—	3	1	Robin Hood of Texas.....mus-wes AYC
—	13	2	Romance of Rosy Ridge.....mus-dr AY
—	9	1	Roosevelt Story, The.....doc AY
—	1	2	Russian Balerina.....mus-com A
—	4	1	Rustlers of Devil's Canyon.....wes AYC
—	1	4	Saddle Pals.....mus-com AY
1	2	3	San Demetrio, London.....war-mel AY
—	5	9	San Quentin.....mel A
—	3	4	Sarge Goes to College.....mus-com AY
—	—	4	Scared to Death.....mys-c A
—	3	5	Second Chance.....mys-mel AY
1	11	2	Secret Life of Walter Mitty, The.....mus-com-c AY
—	2	2	Sepia Cinderella.....mus-com A
—	4	4	Seven Keys to Baldpate.....mys AY
—	1	2	She Returned at Dawn.....dr A
2	5	4	Shoe Shine.....dr A
—	—	—	Shop Girls of Paris.....dr A
—	9	—	Sin of Harold Diddlebock, The...com A
—	3	8	Singapore.....mel A
—	4	8	Slave Girl.....com-c A
—	6	3	Something in the Wind.....mus-com A
—	3	3	Son of Rusty, The.....dr AYC
1	3	4	Song of Love.....mus-dr AY
—	5	5	Song of the Thin Man.....mys-mel A
—	1	3	Song of the Wasteland.....mus-wes AYC
—	2	4	Spoilers of the North.....mel A
—	4	3	Sport of Kings.....dr AYC
—	3	1	Springtime in the Sierras...mus-wes-c AY
—	10	4	Stallion Road.....dr A
—	—	6	Stepchild.....soc-dr A
—	1	5	Stork Bites Man.....com AY
—	—	3	Swing the Western Way.....mus-wes AYC
—	4	6	Tarzan and the Huntress.....adv A
1	4	2	Tawny Pipit, The.....com AYC
—	1	4	That's My Gal.....mus-com-c A
—	6	6	That's My Man.....dr AY
—	11	9	They Won't Believe Me.....mel A
1	13	2	This Happy Breed.....dr-c AY
—	5	4	Three on a Ticket.....mys-mel AY
—	6	1	Thunder Mountain.....wes AYC
—	3	15	Time Out of Mind.....nov A
—	3	2	Too Many Winners.....cri-mel A
1	5	2	Torment.....dr A
—	6	6	Trail Street.....mus-wes AYC
—	6	3	Trespasser, The.....mys-mel A
—	7	10	Trouble With Women, The.....com A
—	2	3	Twilight on the Rio Grande...mus-wes AYC
—	—	4	Twins.....com A
—	2	3	Two Anonymous Letters.....war-dr A
—	5	11	Two Mrs. Carrolls, The.....mel A
—	6	1	Under the Tonto Rim.....wes AYC
—	8	—	Undercover Maisie.....com A
1	7	5	Unfaithful, The.....dr A
1	6	1	Unfinished Dance, The.....mus-dr-c AY
—	3	1	Unsuspected, The.....mys-mel A
—	3	5	Untamed Fury.....mel A
—	—	5	Vacation Days.....mus-wes AYC
—	1	2	Valley of Fear.....wes AYC
1	6	—	Variety Girl.....mus-com-c AY
—	5	5	Vigilantes Return, The.....wes-c AYC
—	2	7	Violence.....mel A
—	3	4	Vow, The.....dr A
—	—	3	We Lived Through Buchenwald...war-doc A
2	13	2	Web, The.....cri-mel A
—	2	6	Web of Danger.....mel A
2	15	2	Welcome Stranger.....mus-com AY
—	1	2	West of Dodge City.....mus-wes AYC
—	2	2	West to Glory.....mus-wes AYC
—	6	6	Wild Harvest.....mel A
—	4	2	Winter Wonderland.....rom A
—	3	11	Woman on the Beach, The.....dr A
—	6	3	Wyoming.....wes AYC
—	3	1	Yank in Rome, A.....war-dr A
—	1	5	Yankee Fakir.....cri-mel AY
—	—	3	Youth Aflame.....dr A
—	—	4	Zero de Conduite.....dr A

The Consumers' Observation Post

(Continued from page 4)

and its separation when required later, without requiring excessive force to be applied. The compound is a cream to tan colored, sticky paste of oily odor which on analysis was found to consist chiefly (56%) of calcium carbonate (whiting or ground chalk) with about 44% of an oil identified as rosin oil. So-Lo's composition would appear to be a satisfactory one for the purpose.

All (Detergents, Inc., Columbus, Ohio) is a so-called "complete laundry powder" developed for use in the Westinghouse Laundromat and Bendix Home Laundry and approved by the manufacturers of those washers, which sells at 49c for a 1 lb. 8 oz. box. An analysis of this product indicated that it consists of 40% sodium pyrophosphate and 18% of a synthetic detergent of the type known as non-ionic surface-active agent; the balance is cornstarch, with an odor of pine oil. Total alkalinity as sodium oxide was 9.5%; the pH of a 1% solution was found to be 8 to 9. This means that the product as used has a lower pH even than soap. (Soap in solution has a pH of about 10.5) Tests of the efficiency of All were made by standard Launderometer tests; Lux, chosen as a typical good neutral soap, being used as the control. All when tested in the washing of soiled cotton fabric in a Launderometer against Lux used as a reference standard, turned out to be a poor detergent; it did not even approach the detergent efficiency of soap in cleaning cottons. Under the special conditions of automatic washing machines, some of which, at least, require a minimum of suds, All might, however, work out to be better than Lux.

"Chat" Liquid Detergent (General Aniline & Film Corp., 230 Park Ave., N.Y.C.) is another of several products tested by CR that is intended for use in automatic dishwashers. Chemical analysis reveals that the composition is approximately as follows: potassium soap, 15%; trisodium phosphate, 2%; sulfonated synthetic detergent (soap substitute), 2%; sodium silicate and sodium pyrophosphate, both in the amount of about 0.5%; the balance (80%), water. The

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pH of this material is greater than 12 (which would make it too high for use in dishwashing by hand).

KuvRon (Mona Chemical Corp., 715 Washington St., N.Y.C.), 35c for a 3-oz. bottle, is a liquid skin protector in lotion form, serving the same purpose as the protective creams tested by CR in 1944. It was used as directed to test its protective effect. Protection against ordinary dirt, carbon paper, and typewriter ribbon was good; against a cleaner of the Stoddard solvent type, very little; against shoe polish (Kiwi dark brown or black), practically none. Gave no protection against dry basic dyestuffs, although this factor would be of interest to very few consumers. On a hot day, the perspiration of the hands kept the coating of KuvRon sticky. An office worker would probably find the product satisfactory, as it protects well against the forms of soil encountered in that type of work and, except under conditions of perspiration, the hands do not feel that they have a coating applied. Product warrants a B-Intermediate rating.

Bu-Tee-Shop Home Permanent Wave (Halgar, Inc., 251 E. Grand, Chicago 11), \$3.98. Kit contained 6 spacers, 6 aluminum curlers, 6 felt protectors, 6 clamps, 24 heat pads, 24 end papers, and a small bottle (amount not labeled) of wave solution. Chemical analysis indicated that the wave solution was a typical sulphite wave solution containing ammonia and soap. The heat pads contained a chemical which supposedly gives off heat when moisture is applied. The product is the typical machineless-heat-type of permanent wave, which is considered safer, particularly for home use, than the cold-wave method. The heat pads seemed a bit cumbersome for self-application. More important, however, was that, when the heat pads were used, they became barely warm in several instances, did not generate steam, and did not become really hot either in a few seconds, as claimed, or after several minutes. The failure to heat up may have been due to deterioration of the pads, in stock, but in any event, the fault made the appliance ineffective.

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PHONOGRAPH RECORDS



By Walter F Grueninger

Please Note: Prices quoted do not include taxes. In the ratings AA indicate highly recommended; A, recommended; B, intermediate; C, not recommended.

ORCHESTRAL

Grofé: Mississippi Suite (3 sides) & **Cadman: From the Land of the Sky Blue Water & Lieurance: By the Waters of Minnetonka** (1 side). Kostelanetz and His Orchestra. Columbia Set X 284. \$3.35. The news is the container designed to facilitate handling for automatic record changers—a cardboard box without record envelopes, enabling the user to lift out the records, place them on the spindle and play. The "recortainer" is in line with Columbia's announcement that it will manufacture no more manual sets. The Grofé music, lacking inspiration, palls after a hearing or two. Performance and recording of all sides—elegant.

Interpretation AA
Fidelity of Recording AA

Holst: The Perfect Fool—Ballet Music. London Philharmonic Orchestra under Sargent (3 sides) & **Wagner: Ride of the Valkyries.** London Philharmonic Orchestra under de Sabata (1 side). Decca Set EDA 31. \$5. "Dance of the Spirits of Earth, Water and Fire" comprise the intriguing contrasting movements in this comic ballet from an opera that failed. The music entertains without benefit of ballet. A rousing filler completes an above-average set. Fine direction and powerful recording.

Interpretation AA
Fidelity of Recording AA

Mozart: Symphony in D (K 133). Vox Chamber Orchestra under Fendler. 4 sides, Vox Set 171. \$5. First recording of an early work interesting for its ingratiating second movement, calling for strings and flute only, with violins muted. Recorded in Carnegie Hall but the violins, particularly, lack bite. Wavering of pitch on side 3. Buoyant performance, though at times a lighter touch would have improved matters. Pressed on plastic.

Interpretation A
Fidelity of Recording B

Thomson: The Plow That Broke the Plains. Hollywood Bowl Symphony Orchestra under Stokowski. 4 sides, RCA Victor Set 1116. \$2.85. Most incidental music composed for films fails to stand up when presented on records. An exception is this suite performed in a 1935 documentary. The numbers bear such titles as "Pastorale," "Cattle Blues," "Drought," "Devastation," etc. Performance—first-rate. Recording—topnotch, except for wiry violins which are improved by turning down the treble control.

Interpretation AA
Fidelity of Recording A

A Wagner Program. NBC Symphony Orchestra under Toscanini. 8 sides, RCA Victor Set 1135. \$5.00. Toscanini's Wagner! Everything one hears here is likely to increase the appreciation of this marvelous conductor. "A Faust Overture," "Siegfried Idyll," and the "Ride of the Valkyries" are included. I wish, however, that the recording were more resonant, less harsh, and less narrow in frequency range.

Interpretation AA
Fidelity of Recording A

CONCERTO

Bach: Concerto in D Minor for Two Violins and Orchestra. Heifetz (violin) and the RCA Victor Chamber Orchestra under Waxman. 4 sides, RCA Victor Set 1136. \$3.00. A trick album, with Heifetz playing both solo parts, in this most frequently played concerto for two violins. Compared with the best of the competition, Adolph Busch-Frances Magnes soloed Columbia Set X 253, I prefer Columbia for its marvelous integration and realization of Bach style, absent at times in Heifetz's performance. Moreover, Heifetz's playing is all but lost on occasion in the orchestral background and his side 4 (my pressing) is unusually noisy and fuzzy.

Interpretation B
Fidelity of Recording A

Beethoven: Concerto in D Major for Violin and Orchestra. Szigeti (violin) and the Philharmonic-Symphony Orchestra of New York under Bruno Walter. 10 sides, Columbia Set 697. \$7.10. Among the master works of violin literature. Szigeti plays with the understanding of a superb musician, meeting technical challenges with little difficulty, as was the case in his older, now surpassed Columbia Set 177. Recording of the violin in Set 697 bears an edge which can probably be corrected on most high-fidelity sets by lowering the high-frequency control. Heifetz and Toscanini in Victor Set 705 offer energetic, breath-taking competition, however, which many will consider superior. Certainly both sets are first rate.

Interpretation AA
Fidelity of Recording AA

CHAMBER AND INSTRUMENTAL

Old Music Box Melodies: Religious—6 sides, Bornand Music Box Set 2. \$5. **Old Favorites—6 sides,** Bornand Music Box Set 3. \$5. Excellent reproduction of music box performances of "Abide with Me," "The Palm Branches," "Nearer My God to Thee," etc., in Set 2 and "Home Sweet Home," "Mocking Bird," "In the Gloaming," etc., in Set 3.

Interpretation AA
Fidelity of Recording AA

VOCAL

Bach: Mass in B Minor. Robert Shaw conducting the RCA Victor Chorale and Orchestra. 34 sides, RCA Victor Sets 1145/6. \$19.00. Great Bach and some think the supreme choral masterpiece. The chorus appears to be smaller than that heard in most concert hall performances, enabling more detail to stand out. Shaw's insight is less keen than I had hoped, though his control is firm. Some of his tempi are unorthodox. Vocal quartet—acceptable though lacking in warmth and definitive style. Orchestra—first rate. Overall, I admire the performance but I am not moved by it. Recording—pinched, with too little bass and coarser than Columbia gave us in the English recording of Handel's *Messiah*, Columbia Set 666. Compared with the competitive *Mass* recording, Victor Set 104, the new one achieves honors in performance, except for the quartet, and in recording. Some surface noise.

Interpretation A
Fidelity of Recording B

Heritage Series. The third release of plastic re-issues of original Victor masters recorded between 1906 and 1914, priced at \$2.50 each record, includes the following: Battistini sings arias from *La Favorita* and *Martha* on record 15-1010; Louise Homer sings an aria from *Les Huguenots* and Schubert's *Die Allmacht* (15-1011); Schumann-Heink sings "Brindisi" from *Lucrezia Borgia* and Arditi's *Leggiero Invisible* (15-1012); Dalmorès sings arias from *Romeo and Juliette* and *Carmen* (15-1013); Emmy Destinn sings "Un bel" from *Madama Butterfly* and "Suicidio" from *La Gioconda* (15-1014). Schumann-Heink is particularly impressive in her display pieces as is Emmy Destinn in two famous arias.

Seasonal Hymns, Carols and Chorales. St. Luke's Choristers under Dorn. 8 sides, Capitol Set BD 45. \$3.75. Religious numbers for Thanksgiving, Advent, Christmas, Lent, etc., sung with humility by a boys' choir of Long Beach, Calif. Spacious recording.

Interpretation AA
Fidelity of Recording AA

Rosenblatt: Gems of the Synagogue. Cantor Josef Rosenblatt (tenor). 6 sides, Victor Set S 48. \$3.85. A memorial album presenting sacred gems which are part of the traditional Jewish service, sung by the composer who was one of the foremost cantors of his time. He died in 1933. Thrilling performances. Some surface noise. Recording adequate. Unusually interesting set.

Interpretation AA
Fidelity of Recording B